THE BUILDER

VOL. XCIX.—No. 3529. SEPTEMBER 24, 1910.

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No. 4, Wimpole-street, W. Mr. W. Henry White, F.R.I.B.A., Architect.

Porte du Roi, Mont St. Michel. Drawn by Mr. William Ansell, A.R.I.B.A.

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THE SCHOOL OF THE FUTURE.

We greet with enthusiasm the progress that is being made in regard to the open-air school, and heartily commend to our readers the valuable contribution by Mr. Reginald G. Kirkby on this subject to the Royal Sanitary Institute. We have the utmost confidence in expressing our view that the movement recently started will go much farther than is at present generally anticipated. Mr. Kirkby himself, though clearly realising the possibilities of the work he has in hand, appears so far to have confined his advocacy of such schools to those for the physically defective, but we feel sure that the results already achieved, and the advances that will inevitably follow more experience in the conduct of these open-air schools, will cause the principle to be extended to schools for the fit as well as those for the unfit.

No doubt the cost of maintaining and running the new type of school is more than that for the old, but this discrepancy would tend to disappear as experience is gained, and most assuredly the open-air school should cost less to erect, thus supplying the answer to the recent appeal of the Board of Education for economy in the cost of school buildings.

In order that such schools should be successful the teachers would have to be trained to thoroughly reorganise the present system of teaching, and this could only be done at the instance of an authoritative committee at headquarters. It is obvious that a large proportion of the children's work would have to involve bodily exercise, and that sedentary pursuits could only be carried on for short periods at a time. The curriculum would also demand modification according to the season, and in our variable climate much would have to be left to the discretion of the head teacher, whose position would be one of more responsibility, demanding higher powers of initiative.

We should have to inculcate a little of the spirit of the Japanese *Samurai*, scorning the fire as effeminate and maintaining bodily warmth by exercise. It is absurd to suppose that four or

five half-hours per day is not enough for any child to spend in sedentary work up to the age of twelve, and when we consider the vast amount of valuable instruction that can be given by methods which, essentially sound, are best known by the humorous travesty of them associated with the name of Squeers, it is easy to realise that the open-air school will offer quite as efficient a means of educating young children as the present type, and that as regards health and physique the children will be incomparably better off.

Objection will doubtless be made that our climate is probably as ill-suited to the method as could well be imagined, and it must be admitted that there are days when the prospect does not sound attractive. All the same, we believe it is not beyond the skill of our architects and engineers to devise means for mitigating the severity of wind and damp; the well-arranged open-air school ought to have as much shelter as possible by walls and planting from the north-east round to the south-west, while there should be a certain flexibility about the open fronts by the provision of movable glazed screens, blinds, and shutters that would break the force of the wind or deflect it from the interior. Details such as these are, of course, largely matters of experiment and experience, but there does not appear to be any insurmountable difficulty to be overcome.

Of course, such school buildings ought to consist of one story only, but when the time comes to remodel our city schools on these principles we shall have to make the best use we can of the upper floors. The spacious and well-equipped playground and garden with which every open-air school should be provided will also involve considerable expenditure in the case of schools in crowded districts, but for the sake of both the school and the district this expenditure will have to be faced if the present insanitary conditions and ineffective methods of education are to be abolished.

That we are not alone among the nations in realising the reforms that are bound to come is recognised by those who have studied recent developments in Germany and France. The former country may be regarded as taking the lead in this question, but France is also quite alive to the necessity of reform on these lines; only last month, at the third Congress on Educational Hygiene held in Paris, the following statements were made:—

"Light and air, the fundamental bases of life, and without which no human being can live in health, should dominate in every detail the design of school buildings."

"It is almost impossible to hope for a normal state of health for the crowds of children passing long hours in school if the buildings are not isolated by a screen of abundant vegetation."

"In America the problem has been boldly treated by the installation of schools in the open country, just outside the towns, and by giving special facilities at reduced rates for the children's daily journeys."

"The open-air school is not a Utopian dream, as many imagine. With prudence, method, and, above all, patience, it will be possible, in many cases, to establish them successfully."

"It is essential that the child should be surrounded by foliage, flowers, and all those natural beauties that are apt to be forgotten in the artificial life of the city."

"We are the slaves of superannuated traditions and irrational habits due to town life."

The conclusions arrived at by this Congress in regard to schools are that they should be isolated and surrounded by trees and shrubs, that they should be open throughout to the beneficent influences of the sun's rays and fresh air, and that the most careful attention should be given to the selection of suitable materials and methods of construction in preference to attempting ornate architectural effects.

The view was expressed that the architect should be the paramount authority on hygiene, that he should feel it of the highest importance in the practice of his art to study every circumstance and every measure aiming at the amelioration of conditions inimical to public health. Finally, M. Augustin Rey puts forward the following resolutions:—

"That in school architecture costly methods of construction and external decoration should be abandoned, and the expenditure should be concentrated on internal arrangements and hygienic fitness.

That every school site should be large enough to provide for isolation of the buildings and for a garden entirely surrounding them."

The first of these resolutions leaves us comparatively unscathed, as it is now generally recognised in this country that school buildings should not attempt an ornate architectural effect, but the second carries us beyond the point reached by the general standard of our schools at the present time.

Clearly, both abroad and at home, we are on the eve of a revolution in our educational methods, and it behoves architects to be alert and equipped to take their part in the movement that is now in progress. The public, too prone to regard architects as a conservative race of beings wrapped up in the traditions of their art, must be allowed no excuse for strengthening such an impression. In a matter of this importance every architect interested in school buildings should be qualified to lead rather than to follow public opinion.

THE TRADE UNION CONGRESS.

THE Trade Union Congress has been marked this year by the ability displayed by its President and by the limitation of the subjects discussed. The Osborne decision occupied considerable time, but to that we referred last week. Among the other questions discussed were certain points connected with the unions and the Labour Party, such, for instance, as the amalgamation of the Trade Union Congress, the General Federation, and the Labour Party, the motion as to which was lost, but a resolution for the national federation of all trades was carried; whilst a resolution for the amalgamation of unions by industries was also affirmed.

The Congress showed itself opposed to the new policy of railway amalgamation, unless satisfactory clauses can be inserted in the Bills for the protection of the staff, and the objection to this policy seems to have assisted the passing of the usual resolution in favour of nationalising the railways. A more serious question was raised in connexion with Labour Exchanges, which, in the opinion of the Congress, are proving prejudicial to trade unionism, and a resolution was carried to the effect that the trade union officials should be supplied with the rate of wages paid by any firm offering employment through the Exchanges, that the trade union rates and conditions of each district shall be observed where any person is sent out of a district, and that no application should be entertained from firms who have a dispute at the time with their workpeople. Mr. Shackleton made a very moderate speech on this subject, and, seeing that the Labour Exchanges have for their ostensible object the circulation of labour with a view to the equalisation of employment, it is obvious that much of their usefulness will be lost if they are subjected to too severe restrictions. The trade unions are represented on the Labour Exchanges, and the good sense of all parties must be trusted neither to allow them to be converted into trade union branches, nor, on the other hand, to allow them to interfere with the legitimate objects of trade unionism.

Other resolutions carried related to the action of employers during trade disputes, first protesting against the international exportation and importation of labour, and in the second place suggesting the prohibition of employers housing workmen in places uncertified as dwelling-houses. In considering amendments to the Acts regulating mines, it was also moved and carried that employers should not have power to evict tenants who were employees during trade disputes.

The resolution for a universal eight hours' day as usual received support, and as regards unemployed assurance it is noteworthy that a resolution was passed to the effect that all financial arrangements in connexion with such a scheme between the members of trade unions and the State should be conducted through the unions. The Congress, however, expressed the opinion that no system of compulsory assurance will affect the problem of unemployment, and again pressed for the passing of their Right to Work Bill. From the above brief summary of some of the principal resolutions it will be seen that, whatever may be thought of the merits of the schemes embodied in the resolutions, the Trade Union Congress of 1910 was less discursive than have been many of its predecessors.

Cluny Abbey.

THE one-thousandth anniversary of the foundation of Cluny was celebrated last week by a religious and archæological congress, organised by the Mâcon Academy. The Benedictine Abbey was established in 910 by William, Duke of Aquitaine, near Mâcon, midway between Lyons and Châlons-sur-Saône, and until the time of the Revolution possessed a revenue of some 12,000*l.* per annum, with 600 dependent religious houses. The five aisles and double transepts were dismantled in 1789, and the materials were used in the buildings of the town; the two towers, however, and the XVth century Chapelle de Bourbon escaped from demolition, together with part of the abbots' palace, the cloisters being converted into a public square. The church, as rebuilt in 1090-1130, was 550 ft. long, the narthex and western towers extending some 100 ft. further westwards; the aisle-vaulting rose to a height of 100 ft.; the plan of the east end comprised an apse, ambulatory, and radiating chapels.

NOTES.

A.A. Lectures on Town Planning.

In view of the great interest that the public is taking in the forthcoming Town Planning Conference the Council of the Architectural Association have decided that their new courses of lectures on the subject shall be thrown open to non-members of the Architectural Association. We feel that such a departure from their usual practice deserves commendation, it being most desirable that all who take an interest in the question should have every possible opportunity of extending their knowledge of the principles of civic design.

The Building Trade and Strikes and Conciliation.

In our recent article on the building trade and changes in rates of wages (September 10) we made a passing allusion to the example shown by this trade in resorting to conciliatory measures in adjusting trade questions as they arise. The publication by the Board of Trade of the twenty-second annual Report on strikes, lock-outs, and conciliation now enables us to consider this point in greater detail. As regards trade disputes in all trades, the year 1909 compares favourably in some respects with other years in the decade 1900-9. Four hundred and thirty-six disputes commenced in the year, affecting directly and indirectly a larger number of workpeople than in any of the previous nine years—300,819 persons; but the duration of the disputes in working days—2,560,425—compares favourably with the previous years and with 10,632,638 working days in 1908. Moreover, the adjustment of the eight hours' working day in mines under the new Act accounted for 49 per cent. of the number of workpeople affected by disputes. In the building trade but 1,592 workpeople were involved either directly or indirectly in disputes, compared with 2,892 in 1908, the proportion to those employed being lower than in any other trade. The duration of such disputes in working days was 19,860, showing a shorter duration than in any year in the decade. In the disputes in the building trade 3·1 per cent. of the workmen directly involved completely attained their object; as regards 43·5 per cent. the employers were successful; but in 53·4 per cent. a compromise resulted. Considering the extremely depressed condition of the building industry and the long duration of this depression, we consider that these figures reflect the greatest credit on all connected with this trade.

L.C.C. Central School of Arts and Crafts.

The exhibition of work done during last session at this very excellent institution confirms once more our impression that art can with difficulty flourish in an atmosphere even of such a mild form of officialism as this and other such schools must inevitably create. But this by no means applies to craft and technique. In this direction, when individuality of outlook is hardly possible at the outset under any circumstances, the measure of identity permissibly displayed by the instructor, together with the means and appliances which a well-backed institution may provide, should, given capable teachers and average material, produce very fair results. In the case under consideration these conditions undoubtedly do so. Perhaps the roll of teachers, including so many well-known names, is more distinguished than that which most schools of the sort can attract; perhaps also in one or two classes, the central position of the school in the metropolis and the desirability of the knowledge it purveys, attracts a brighter type of pupil than is usual. But, be these things as they may, the result as displayed is to be commended. To be commended also is the zeal and perseverance which enables so many improvers and apprentices, after a day's work at some one side of any one craft, to attend the school all through the winter months and work to obtain an individual grasp of the whole. Amongst the subjects and classes which are displayed those seem to be the best which are most craft and tradition and least fine art, such as bookbinding—in which we think that more care should be taken to bind only those books which are worth the effort—and manuscript and leaded glass and metalwork—especially the metalwork cups, teapots, small castings, and the like. As one gets more into the sphere of pure design the quality of the work becomes correspondingly doubtful until in the architectural display—a design for a clock-tower—we come to what it is our duty to condemn. It is very poor indeed. It would, however, be inaccurate to conclude our remarks on such a note. The general impression we received and wish to convey is quite the reverse.

"Encyclopædia Britannica."

We are informed that the forthcoming eleventh edition of the "Encyclopædia Britannica" will be ready by the end of this year, or, at the latest, in the first month of 1911. As our readers are doubtless aware, the Encyclopædia is now in the hands of the Cambridge University Press. It was soon found, after the issue of the "stop-gap" edition of 1902, that the magnitude of the task then initiated of preparing an entirely new edition, and the authoritative nature of the growing work, was too vast an enterprise to be a permanent addition to the activities of a newspaper. It was also realised that the proper origin and abiding-place for the foremost work of reference used by English-speaking people throughout the world was not a newspaper office, but a great learned institution. So the University of Cambridge, whose authorities were fully satisfied with the solid and scholarly foundations laid by the *Times*, decided to take over the copyright and control of the entire work, the connexion between the *Times* and the "Encyclopædia Britannica" having ceased on January 1, 1910. The most important of the new features which will signalise the publication of the eleventh edition is the fact that the whole of the work has been in progress and is to be issued at the same time. Eight years have been devoted to the task of simultaneous construction of the entire work, in twenty-eight volumes, under the guidance of an exceptionally large editorial staff, and with the assistance of some 1,500 contributors, representing the scholarship of every important University and other centre of research in the civilised world, and also representing the practical knowledge acquired in all the great engineering, manufacturing, and commercial enterprises of the twentieth century.

The Princess's Theatre, Oxford-street.

This theatre, which is about to give place to an "American" music-hall, was built thirty years ago after designs by C. J. Phipps, with 2,150 seats, and the then novelty of a balcony over the main entrance. At a projected sale by auction in 1897 the property, covering a site of 21,500 ft. super., and held under a lease to expire in July, 1940, granted by the Duke of Portland's trustees at a ground rent of 1,800*l.* per annum, was withdrawn after a bid of 20,500*l.* It stands on the site of the Queen's Bazaar, which, after a fire in 1829, was rebuilt for the "Physiorama" and similar exhibitions. Nelson and Crace remodelled and decorated the house for Hamlet, the silversmith of Cranbourne-street, as a theatre for English opera and promenade concerts. The play-bill for the opening night, October 6, 1840, states that Queen Victoria had granted leave before her accession that it should be called "The Princess's." The present house was the scene of Sir Henry Irving's first appearance (1859) in London. It is memorable for the performances of Macready and for the subsequent production of the French drama with the notable revival of Shakespeare's comedies and historical plays by Charles and Mrs. Kean.

Manchester Art Gallery and Library.

The Manchester City Council on Wednesday last decided, by fifty votes to thirty-six, to erect on the site of the old Manchester Infirmary, in the centre of the City, an art gallery and free library at a cost of 250,000*l.* The site was purchased for the sum of 400,000*l.*, but only about half of it will be occupied by the proposed buildings.

ARCHITECTURAL EDUCATION AT HOME AND ABROAD.

By Alfred W. S. Cross, M.A.

Part XIII.

The department of Architecture at Harvard, Cambridge, Massachusetts, the oldest University in the United States, is of comparatively recent foundation.

And so when, in 1894, the curriculum of study was in the course of formation its organisers had the inestimable advantage of being able to turn to account the knowledge and experience gained by other colleges and schools which had made earlier efforts to grapple with the difficult question of architectural education. The average age of entry is eighteen and a half years, and admission to the School of Architecture can only be obtained by passing the general entrance examination required from all students of the University. The courses of instruction, of four years' duration, for the degree of Bachelor of Science in Architecture are arranged as follows, viz.:

First Year.—History of Architecture, Elementary Architectural Drawing, Principles of Delineation (Colour and Chiaroscuro), Trigonometry, Analytic Geometry, Rhetoric and English Composition, German or French, Experimental Physics.

Second Year.—Freehand Drawing, History of Architecture, Elementary Architectural Design, Elementary Statics, Elementary Structural Design, Descriptive Geometry, Stereotomy, English Compcsition, German or French.

Third Year.—Freehand Drawing, History of Architecture, Architectural Design, Theory of Design, Building Construction, Masonry and Foundations, Geology and Mineralogy, and one of the following courses, viz. :—

Principles of Design in Painting, Sculpture and Architecture, History of Greek Art.

The Fine Arts of the Middle Ages and of the Renaissance. Private Life of the Greeks (as illustrated by works of art), Private Life of the Romans (as illustrated by works of art).

Fourth Year.—Freehand Drawing, Architectural Design, Modelling, Contracts and Specifications, and *two* courses, not already taken, selected from the nine following, viz. :—

The five courses set out above as available for the third year.

Classical Archæology.

Æsthetics.

Water Supply and Sanitary Engineering.

Heating and Ventilation.

The above curriculum has been drawn up with the object of enabling the student to commence his professional studies in the first year of his University career. The studies of the Architectural school may be roughly grouped under three heads :—

(1) History. (2) Drawing. (3) Design.

History.—The History of Architecture is taken in three successive years. In the first few weeks of his course the student acquires facility in the simple representation of architectural form, and learns the elementary principles of projection, perspective drawing, and shades and shadows. He then traces the gradual development of architectural forms and the technical processes of construction by the examination, in detail, of important buildings and the analytical study of the structural and æsthetic principles upon which the design depends. Students, who are encouraged to make the greatest possible use of the library and to familiarise themselves with books and their use, continue the study of the subject matter of the lectures they attend by the preparation of drawings, written reports and theses; and special subjects for research are also given upon which essays, based upon the knowledge thus obtained, have to be compiled.

Courses of Ornament and the principles of Design as applied to Ornament are also included under this head. Architectural form and composition are studied by means of the History of Architecture, not as much archæologically as in the more living way arising from the necessities of actual practice; or, in other words, every effort is made to induce the student to obtain a knowledge of the underlying principles of design by an analysis of the growth of architectural form and its use.

The relationship of architecture to the other arts is explained by courses of lectures on the general history of the fine arts.

Drawing.—During their first year students are required to make a series of carefully rendered drawings of simple buildings or parts of buildings in addition to examples of each of the Orders. Subsequently much attention is given to the preparation of drawings essential to the artistic presentation of architectural subjects, or for cultivating the sense of composition in architectural design.

Design.—The course in Design is open to all students who have obtained a satisfactory knowledge of architectural drawing and of the technical and historical development of the ancient styles. After a course—of a few weeks' duration—of preliminary study, in which the student makes careful drawings, from measurement, of selected examples of architectural composition, the systematic study of Architectural Design is commenced (1) by lectures on the principles of planning and design; (2) by exercises in design from dictation with the view of stimulating the memory and imagination of the student and enabling him to retain the knowledge of form he has acquired in the course of his first year's tuition; (3) by elementary exercises in original composition. At a later period the study of planning is proceeded with systematically and comprehensively, and lectures are delivered on the artistic treatment of the various materials used in building.

In the study of Design it is customary to use the forms of classic art, as it is considered that a mastery of technique and composition is best acquired by securing as complete a knowledge of one style of architecture as the limited time will allow. The advanced course includes the study of the planning and arrangement of important buildings, and finally the preparation of a complete design for a large structure.

The instruction given at Harvard is intended to cover the preliminary technical training required for the practice of architecture, but, as all such training must be supplemented by practical experience in an architect's office, students are advised to devote a portion of their summer vacation to that work.

And in grouping the above-mentioned courses the fact that architecture is a fine art the practice of which must be based upon a thorough knowledge of materials and methods of construction has also been recognised.

For example, great stress is laid on the close study of design, drawing, and scientific building methods, and thorough tuition is given in the history and principles of architecture and of the subsidiary arts.

That those responsible for formulating the curriculum of study at Harvard University are right in strongly recommending students who intend to follow the architectural profession to take, if possible, a full college course before commencing their technical studies is surely sufficiently obvious. The work of the architect requires not only a sound knowledge of building materials, building processes, and familiarity with architectural form, its history and use, but also demands wide intellectual sympathy, cultivated taste, and trained and properly directed imagination.

And such training and cultivation can most easily be obtained—or rather the impulse leading to the full recognition of their utility most readily appreciated—by one who has acquired what is known as a "liberal" general education, for the acquisition of which the ordinary course of study, for the degree in arts, at any University affords the necessary scholastic facilities.

If this preliminary college course is properly planned with a view to his future studies, it is possible for the architectural student at Harvard to graduate in Architecture two years after taking his degree of Bachelor of Arts. Students in the department of Architecture are allowed to compete for the general scholarships open to all students of the University, and in addition the department possesses in its Austen Fellowship in Architecture a special and exclusive reward for graduates of marked ability.

Founded in 1899, this fellowship, which is of the annual value of 200*l.*, is open to those students who, if unaided, are not able to bear the expense of a year's study abroad. Candidates must be Bachelors of Science in Architecture of Harvard University, of not more than three years standing, who have taken degrees in honours. Candidates fulfilling these requirements may present themselves for examination in the History of Architecture and Design. In the latter the subject given must be presented in the form of preliminary sketches prepared in the presence of the examiners, by whom they are retained for subsequent comparison with the finished designs submitted by candidates in the final stage of the competition. A period of three weeks is allowed to each candidate for the subsequent elaboration and perfection of his design, the elements of which he has already formulated.

The successful candidate is required to devote at least one year to travel and study in Europe under the general direction and control of the Professor of Architecture, to whom he is required to send monthly reports of his progress, and, at the end of each half-year, a measured drawing of some important example or examples of architecture.

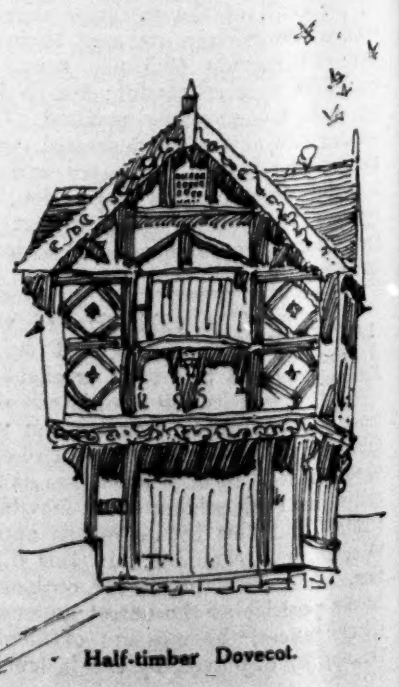
In addition, the travelling student is expected to make an exhaustive study of some special building and to embody the result of his labours in a fully illustrated essay.

The importance attached in America (1) to the preliminary general education of the future architect and (2) to the institution of a systematic and definite course of professional training is well exemplified in the carefully arranged curriculum of study adopted at Harvard University.

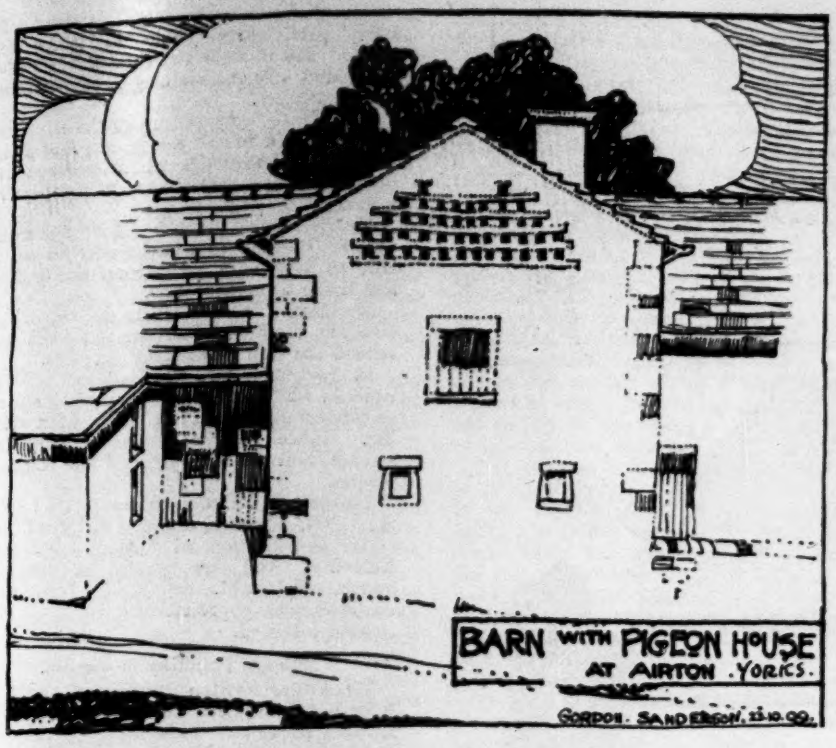
And it is interesting to observe that in America, as in France, those responsible for the administration of the academic training of the architect are fully alive to the fact that, in its way, general culture is as important a factor in the education and professional equipment of the embryonic architect as other attainments of a strictly scientific, technical, or artistic nature. But, unfortunately for English art and English artists of to-day, such a proposition, if seriously put forward in this country some ten or fifteen years ago, would have been anything but acceptable to the large majority of members of the architectural profession.

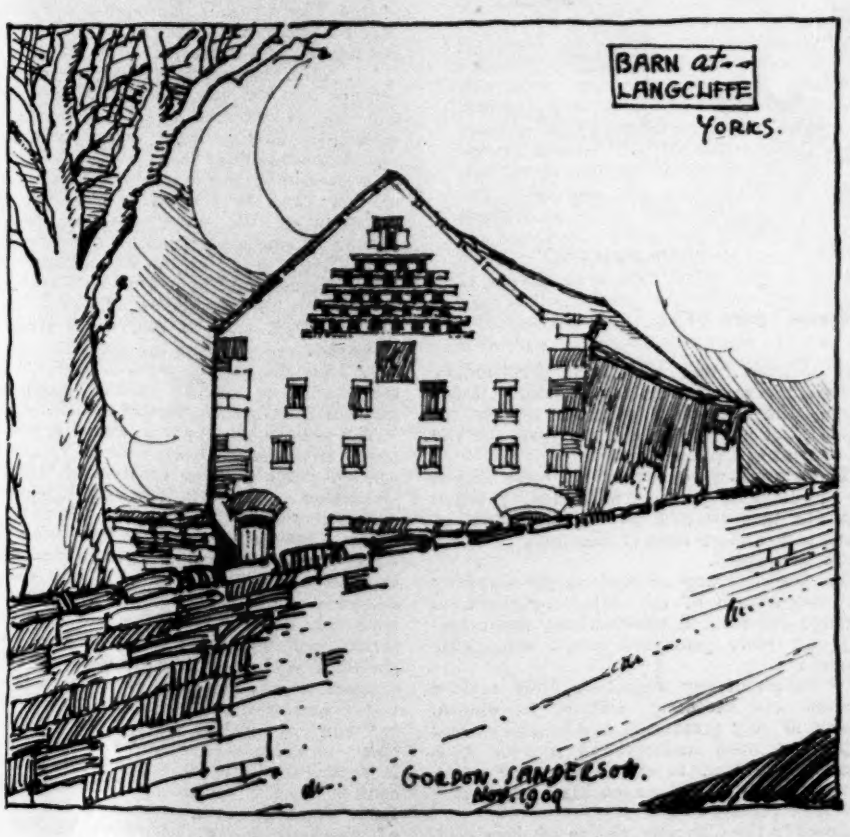
SOME NOTES ON PIGEON-HOUSES.

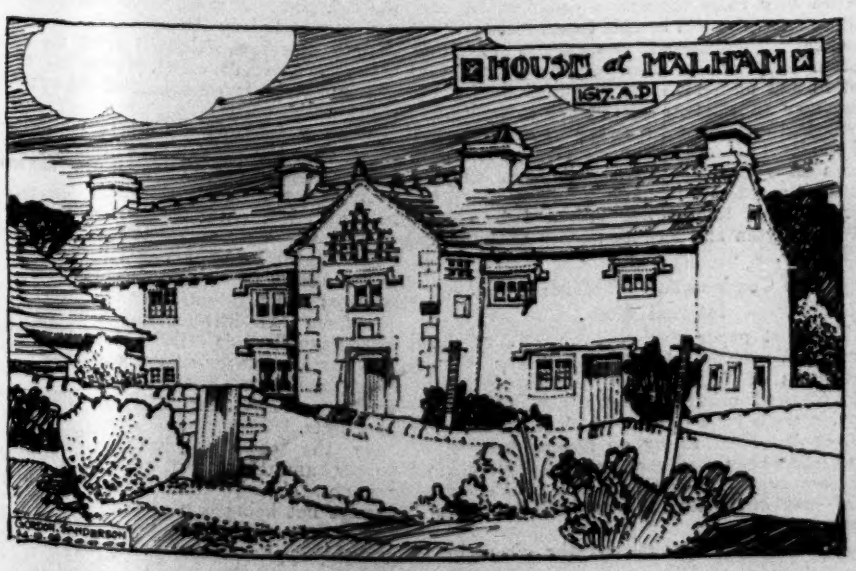
In former times pigeon-houses were necessary adjuncts to the manor house, as the pigeon formed an important item in the "menus" of our forefathers. It is not to be wondered at, therefore, that the places wherein the birds were kept should have been given considerable importance. In many cases separate buildings were set apart for the birds, while in other instances the pigeon-house would occupy some central gable, and form a pleasing feature of the house. Examples of various kinds are shown. A common type is the circular one, the birds entering from a lantern in the top. The Yorkshire barns have rows of pigeon holes in their gable ends with a sundial or "date stone" above them. The laws as regards



Half-timber Dovecot.







the keeping of pigeons were very strict in the Middle Ages. Only the lord of the manor was allowed to keep them, and anyone killing the birds was subject to the death

penalty. The Scotch pigeon-houses are either circular, as at Corstorphine, or square, with a blank wall to the north. The circular pigeon-houses would have a post in the centre with a revolving arm attached, on

which a ladder would be placed so that all the nests were easy of access. In the south of England will be found a number of detached pigeon-houses, square or circular in plan.

THE ROYAL SANITARY INSTITUTE.

(*Continued from page* 309.)

THE Engineering and Architecture section was opened on Wednesday morning, the 7th inst., under the presidency of Mr. Henry Rofe, who, in the course of his address on

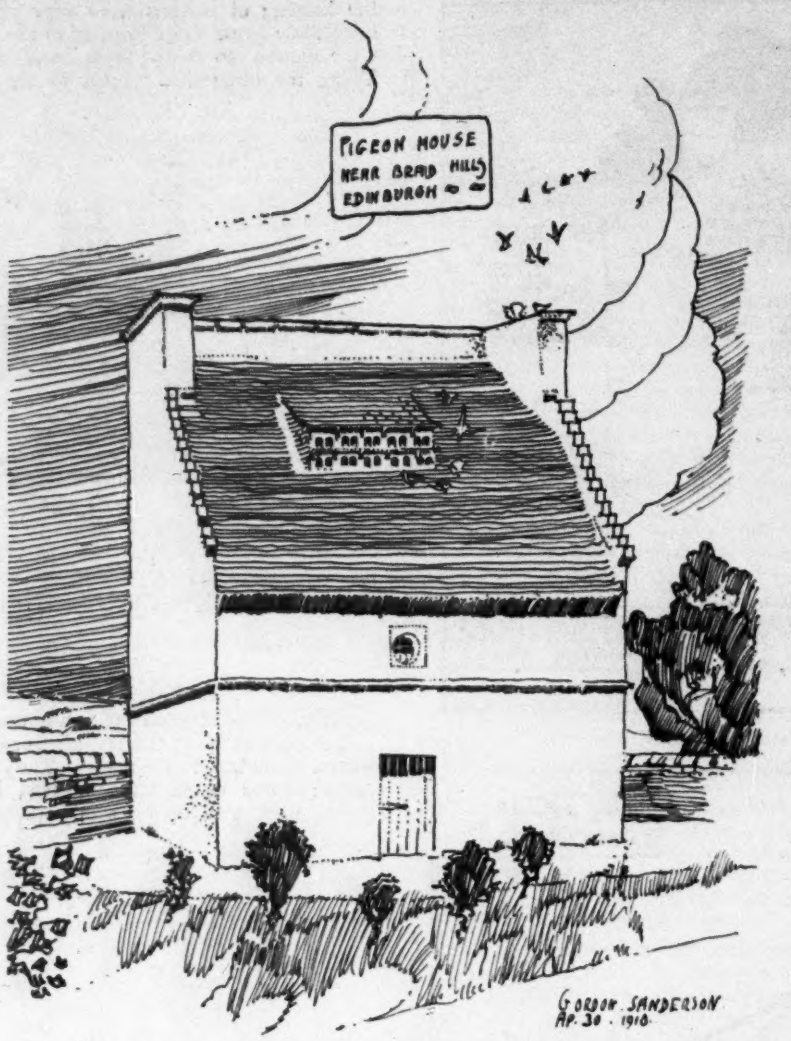
Water Supplies,

said:—

"The question of the provision of fresh sources of water supply is becoming more important every year, and therefore all water authorities should take the greatest possible care to conserve the existing supplies.

With proper regulations and strict supervision the consumption of water can be kept within legitimate limits, with due regard to the comfort and health of the consumers.

Regulations for this purpose were originated



("Some Notes on Pigeon Houses," page 332.)

and have been in force with the best results for a great number of years in towns where the supply of water has always been given on the constant system. Closer attention to this question has in recent years led to great economies, as may be instanced in the cases of two important towns in the West Riding of Yorkshire, where the consumption of water has been so materially reduced that, whilst in both these towns a constant supply has been fully maintained, the expenditure of large amounts of capital on additional works, which otherwise would have had to be incurred, has been considerably deferred.

In the case of gravitation works—so far, at any rate, as impounding reservoirs are concerned—there is practically no depreciation. An earthen embankment fifty years old is probably a stronger structure than one ten years old.

In pumping schemes, first-class machinery which was erected seventy or eighty years ago is in existence and in good condition.

Large trunk mains are in existence and in good condition which have been in use for a much longer time than is now generally allowed for the period of repayment.

Under these circumstances it is permissible to doubt whether some of the severe restrictions with regard to repayment of loans now in force are really beneficial either to the consumer or to the ratepayer. They afford, however, a very strong reason for the exercise of the strictest economy in the distribution of the water, so that if possible a revenue may be earned sufficient to provide the necessary payments to the sinking fund and to avoid a rate in aid.

This question arose during the present session of Parliament in the case of a Bill promoted by an important Water Board which was formed in the year 1897, when the undertaking of a waterworks company was transferred to four constituent authorities.

In 1899 it became apparent that larger works were necessary if the Water Board were to perform their duties properly, and accordingly in that year the construction of an additional storage reservoir was commenced. This reservoir was estimated to cost 157,000*l*., and the Local Government Board, having approved of the scheme, sanctioned the borrowing of that amount of capital, but granted only thirty years for the repayment of the loan."

The President commented at some length on the financial question, and strongly urged that the time allowed for the repayment of loans is too short even if the term of forty years be granted.

Mr. Rofe, having referred to the necessity for co-operation of the water companies to arrange for rainfall observations, the necessity for more geological maps, etc., concluded:—

"Supplies of any magnitude from surface sources are becoming difficult to obtain, except at very great cost, and in many areas dependent upon underground sources it is becoming difficult to obtain sites for wells, except at the risk of encroaching on existing public or private supplies.

Possibly the ultimate solution of these difficulties may come through a combination of authorities, who will be able to afford to go to considerable distances if necessary in order to obtain supplies for their districts, and to obtain and undertake the preparation of the necessary information with regard to rainfall, geological conditions, and the ascertainment of the level of underground waters over large areas in a manner that possibly no single authority could afford to do."

A vote of thanks was proposed by Mr. C. E. Clayton and seconded by Mr. William Whitaker.

The Condensation of Moisture on Internal Walls.

The first paper was read by Mr. H. D. Searles-Wood, F.R.I.B.A., on "The Condensation of Moisture on Internal Walls." It consisted principally of a description of drying walls by a process which Mr. Searles-Wood described as by no means new, but which has been used very successfully for the last ten years on the Continent. The system was that of putting in the walls an atmospheric siphon.

Mr. C. H. Cooper opened the discussion, and remarked on the fact that stone walls were particularly liable to condensation inside. He thought the Council would have great difficulty in obtaining reliable statistics on the subject.

Mr. Munce, commenting on the importance of ventilation in our homes, instanced a case within his knowledge where dampness was due to the fact that the tenant never opened a window.

Mr. Hall was not sure (if strength would permit) whether soft bricks were not preferable to hard ones for internal use, as being less liable to condensation.

Mr. Max Clark alluded to a system of wall building used in Westmoreland which prevented the rain penetrating the joints.

In replying, Mr. Searles-Wood said the walls in which he saw the atmospheric siphons or tubes were at least 3 ft. thick, a fact which Mr. Munce considered would render the introduction of the process into England useless.

Two papers followed on sewage, one by Mr. H. C. H. Shenton, F.S.E., M.I.Mun.E., on "The Sterilisation of Water and Sewage Effluents," and one by Mr. C. Chambers Smith, M.Inst.M. and C.E. These were received most appreciatively, and a full discussion followed.

Sewage Pollution in the Sea.

Mr. Edgar Newton (member of Committee, British Sea Anglers' Society) then presented an able paper on "Some Dangers of Sewage Pollution in the Sea, and the Effects Connected Therewith." He introduced the subject for discussion from the point of view of sea fishing, and suggested—

"1. That the practice of sending untreated sewage into the sea is a danger to (*a*) our fisheries, as instanced by the cases of typhoid outbreaks having their origin in sewage-contaminated oyster beds; (*b*) to our fisheries, as instanced by the tendency to the depletion of fish; and to (*c*) sea bathing from the pollution of the water and the offensive matter causing deposits on the foreshores.

2. That a study of the relative actions of tides suggests that at present sewage is often brought to the foreshores, instead of being carried right out to sea, as is generally supposed.

3. That discharging crude sewage into the sea should be stopped before existing and increasing evils bring further trouble.

The possible danger to a flourishing seaside town from an outbreak caused by sewage contamination may be conjectured from the desolation caused at Worthing by typhoid some years ago.

Some fifty or sixty years ago, before the water-carriage system was generally adopted, earth-closets were used, and the sewage matter was disposed in the ground. At this time fish life was abundant all round our shores, and one might eat oysters and other shell-fish without fear of typhoid and other dangers arising from the discharge of refuse waters and town sewage directly into the sea.

When we consider the thousands that are spent to make seaside towns attractive, one is surprised that the dangers arising from sending the filth, consisting of the many forms from domestic uses, washings, and refuse of chemical works, gasworks, institutions, stables, etc., of these large towns into the sea is so lightly thought of. A further danger now presents itself from the use of tar, etc., on roads, which proves fatal to fish life in our rivers unless carried out with great caution.

We can forgive our fathers for their old ideas, that the sea could swallow up all that was turned into it, as the amount was small compared with now; chemistry and science had not then obtained the results we have to-day, which we appear to neglect, until the rude awakening of, say, a 200,000*l*. scheme, as at Southend, comes along to purify its sewage; and places near by had heavy losses also from their infected shell-fish. Again, in 1908 Faversham is called on for 4,250*l*. costs and damages under similar conditions; Warblington Urban District Council, near Emsworth, in 1906, a sum of 850*l*. damages and part costs.

In the cases at Netley, Southampton Water, and Devonport, where the hospitals are now closed, owing, I am told, to the sewage not being carried away by the tides, but merely traversing up and down (this probably applies on shores also) their respective

waters, and this decision has been arrived at after very costly experiments to improve it, without effect.

An experiment made to find how near the shore pure sea water, i.e., free from sewage pollution, could be obtained resulted in the fact of 25 miles distant from either the English or French coasts.

The records of an ingenious instrument, called the deep sea-current meter, giving similar results, and this in some cases records no currents below, whilst a strong one is flowing on the surface at the same time. This latter refers to the English side of the Channel, but on the French coast the current is much more rapid, and fairly even from the surface to the bottom.

Now, allowing this to be the case, the heavier matter having sunk, and the set of the tide below which is generally shorewards, this deposit gradually works ashore, and is often to be found in the form of a blackish (sometimes greyish-black) coloured substance below the sand, of which the freshly-washed floating sand at high water mercifully covers it, leaving it tidy in appearance as it recedes (but it is there all the same)."

The author referred to a case about two years ago, when a typhoid outbreak occurred at a seaside barracks. A Government inquiry was held, and the trouble traced to the marine swimming-baths. The bath is now supplied with fresh water, and not a single fresh case has occurred. He thought that undoubtedly the discharge of crude sewage into the sea resulted in the depletion of fish life.

In the discussion which followed Mr. E. Willis said that the currents were not generally known sufficiently to decide upon a sea outfall without very careful further consideration. Mr. Price held the view that, providing a suitable position for a sea outfall were obtained, sewage could be disposed of more satisfactorily by sending it out to sea than by any process of spreading it on the land.

Several speakers followed, some holding the views that seaside towns should purify their sewage before discharging it into the sea, whilst others thought this to be quite unnecessary and unjustifiably costly.

The Influence of Underground Water on Health.

The Conference on Thursday was opened with a paper by Mr. Baldwin Latham, M.Inst.C.E., F.G.S., F.R.Met.Soc., etc., on "The Influence of Underground Water on Health." Mr. Latham showed a large number of statistical diagrams from observations and experiments made by himself and others during a period extending over many years.

"The author has been engaged in extensive underground water surveys, comprising the measurement of many thousands of wells in the counties of Bucks, Cambridge, Dorset, Essex, Herts, Hants including the Isle of Wight, Kent, Surrey, Sussex, Wilts, and Warwickshire.

The records of great epidemics which have occurred in former years have shown that such epidemics have invariably broken out in periods of drought. Moreover, it has been observed with regard to diseases such as sweating sickness, plague, cholera, and enteric fever that they run a regular seasonal course, occurring with regularity at certain periods and under certain climatic conditions, and there has been a marked parallelism between the height of the water in the ground and certain of these diseases.

The relation between water and disease is no new discovery, but it is extremely doubtful if any disease is produced by merely the rising and falling of the water in the ground where there has been no previous pollution. On full consideration, in the author's judgment, the ground must have received pollution from the denizens on its surface.

The year 1898, in recent times, was the year in which there has been the lowest ground water. It should also be observed, with reference to the period when deaths mostly occur, that deaths actually follow the period of percolation. There is the most percolation, as a rule, in January, and the least in June, and from June the percolation increases again until the beginning of the following year. The deaths exactly follow the same incidence, and are greatest in January and least in June, so that there appears to be some connexion between the waters passing through the ground and the number of deaths which are recorded.

Temperature has some influence upon the death-rate. Cold has a tendency to kill off the old people, while heat kills off the young; but our investigations clearly show that there is something beyond either heat or cold that affects the results, and which has a marked influence on the ravages caused by disease. The time was only a few years ago that many people thought that epidemics of typhoid fever were due to what was called sewer gas, but it is hoped that the sewer-gas bogey has been laid to rest. Fortunately, there were men, eminent in their profession, who years ago set their faces against the theory that sewer gas could be a cause of typhoid fever, as notably in the case of the late Dr. Richardson, who pronounced his opinion that typhoid and cholera are not spread by sewer air.

The lessons to be learned from the observations of underground water and the outbreak of disease appear to the author to be the necessity of keeping the ground free from pollution, and only to establish works of water supply under such conditions where it is impossible that the water may receive any pollution.

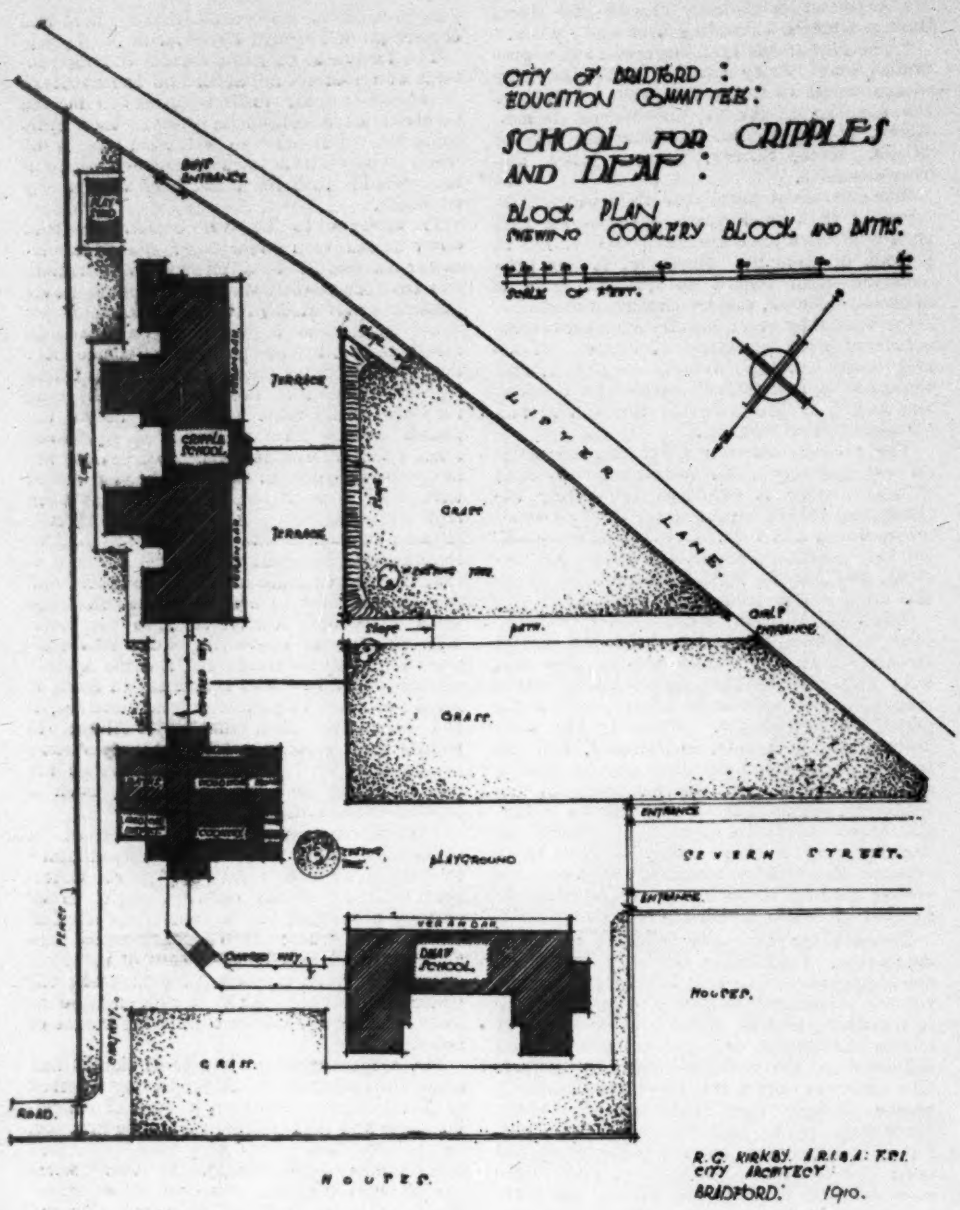
It appears to be very desirable that observations upon underground water should, as far as possible, receive more consideration, and that the records should be extended over as large a part of the country as possible.

In the course of carrying on the well measurements in various parts of the country during many years past the author has found it most difficult to keep observations going for any considerable time, and unless the person owning the well that is measured takes a real interest in it, the observations are likely to fall through, as the author has found that after a time, where a well has been regularly measured, the owners have objected to such measurements being continued, or have covered over the well or filled it up, so that the records could no longer be taken, and in some instances he has found that the deep wells have been converted into cesspools. This practice of converting wells into cesspools ought to be considered a crime against society, and all persons concerned in doing it should be severely punished. Fortunately, it has been established that it is illegal to pollute underground water, but unless some person is injured and legal proceedings are taken nothing is done to prevent such a practice being continued.

The construction of soak-away cesspools in the chalk, oolite, and new red sandstone formations, which form the great water-bearing strata of the country, ought to be entirely prohibited and a penalty inflicted in every case where such monstrosities are allowed, which may be the means of inflicting untold injury on innocent persons using the water of districts which may be located at some considerable distance from the source of pollution."

Mr. Whitaker moved a vote of thanks and opened the discussion. After having referred to Mr. Latham's well-known work of collecting facts and then putting them into practice, he pointed out that only long-continued observations were reliable. It was useless having an even perfect supply of water unless it was kept free from pollution, and this end could principally be arrived at by moral suasion.

View of Resting Shed and one Wing, Thackley School (see page 337).



Mr. James Johnson, Waterworks Engineer to the Brighton Corporation, seconded the vote of thanks. He enumerated some of the many difficulties with which water companies had to contend. For instance, directly it became known that any land was required the price went up enormously. The Brighton Corporation once purchased a large tract of land for 40,000*l.* by secret treaty; had the object of the purchase been publicly known it would have cost 100,000*l.* The large area had only been acquired in order that the Corporation could have authority over the farmers to whom they let it, with restrictions preventing surface pollution. He deplored soak-away cesspools. He disagreed with the Water Supplies Protection Bill, which he described as iniquitous. Fortunately, owing to the opposition of those who knew anything about the subject, the Bill was now dead and buried.

Mr. Cooper (Wimbledon) said that often the local authorities were as great offenders in regard to pollution of the water supply as private individuals. He regretted that the Local Government Board had not taken up the question of records.

In the course of his reply Mr. Baldwin Latham asked, Why should there not be a law in this country similar to that in India, where if a municipality wanted a piece of land for any purpose they simply took it, and Government settled the value on the basis of what it was paying at the time, not on any future prospects?

At this point of the proceedings Mr. P. Boulnois moved:—"That the Council of the Royal Sanitary Institute be recommended to support the movement for the national registration of plumbers, as being likely to promote more effective sanitary work." The days of the bodger and the tinker were, he urged, over, and skilful plumbers were wanted.

Mr. H. D. Searles-Wood seconded, and it was so resolved. It was also agreed, on the motion of Mr. Searles-Wood, seconded by Mr. Osborn Smith, that the Council of the Institute should be recommended to support the measures being taken by the Incorporated Joint Committee on Water Regulations to secure the adoption of a uniform standard of water regulations and fittings.

Mr. Baldwin Latham's paper was on the list of those for the meeting on Wednesday, and being somewhat lengthy, although so important, seriously curtailed the time left for the reading of, and discussion on, the remaining papers. The authors of each, therefore, only presented his paper, which was taken as read.

The Earth-closet System of Sanitation.

Mr. John W. Love in his paper on "The Earth-closet System of Sanitation" proved to be an ardent supporter of this method of disposal, as the following extracts will show:—

"The question how best to deal with closet refuse in rural districts is notoriously one of the most difficult that local authorities have to consider. Methods of treatment that most readily suggest themselves, such as the septic-tank system, are commonly impracticable by reason of the scattered dwellings, making the area to be dealt with relatively a wide one. Moreover, the rent of a large proportion of the houses is usually so small that a rate adequate to meet the expenses of a comprehensive sewer scheme is impossible.

Hence it is that the privy or cesspit appears to be accepted, or, at any rate, tolerated, as being the only practically workable alternative, and, to make the best of what is a bad job—the best, at any rate, that appears to be recognised—local by-laws deal with their construction and their position at some length and in considerable detail.

My own long experience of village closets, both before and since the establishing of parish and rural councils, makes it abundantly evident that, in spite of these regulations, the privy and cesspit are still what they ever have been, namely, an exceedingly nasty and dangerous expedient in place of something better, and this must be the opinion of everyone who has knowledge of them.

The dry-earth system, about which I am to speak and invite discussion upon, has been proposed to meet the difficulty of just such positions outside a drainage area."

The author, having traced the origin of the earth-closet, first brought into public notice by the Rev. Henry Moule, M.A., more than fifty years ago, proceeded to emphasise the antiseptic qualities of earth. He did not draw a comparison between earth-closets and a form of water carriage, but with cesspits and privies, which may be characterised as infinitely worse than any form of water carriage.

"As regards the manurial value of what is termed earth manure, I shall not weary you with statistics, because it is from the sanitary point of view that I apprehend you will judge of the value of the earth system; but it is not to be overlooked that this economic aspect is, too, an important one in connexion with the many movements afoot in the direction of the land, cottage gardens, or spade husbandry, allotments, and small holdings, while coincident with this movement is the diminution of the supply of manure coming from the towns by reason of lesser horse traction.

Earth-closets having, then, a value, and that a high one, from at least two points of view, is it not desirable to make widely known the beneficent power of so generally abundant a substance as common earth, especially when education is in the air we breathe, and strenuous effort is being made to induce habits of rural economy and encourage cottage industries? Should not the high value and the portable character of earth manure be explained, and in these ways the co-operation of cottagers be encouraged to aid their own betterment and help the local authorities in abolishing the utterly out-of-date cesspit and in substituting something better?

Surely there can be but an affirmative answer to these questions!

Is it not, then, amazing, that in the by-laws of many authorities where earth-closets are mentioned they are classed with cesspits and privies, things to which they are diametrically opposed, with which they have nothing in common, and which they were specifically designed to abolish and substitute?

I urge that power be obtained, if it does not already exist, to abolish cesspits and privies altogether, for the reason that they are a menace to public health and offensive to private decency; that at least where it is not possible to establish some other approved system that is better properly-constructed earth-closets should be substituted, and tenant, landlord, or local authority be made responsible for their suitable attention. No new principle is introduced here, for it is a canon of municipal procedure and of reason that when a thing is necessary to be done someone should be made responsible for doing it."

A vote of thanks having been proposed, Dr. Nash seconded. He contended that earth-closets were excellent if the earth supply is finely sifted, and that these fittings are ideal for rural districts.

Mr. Munce supported the vote, but, owing to the ignorance among the poorer people, he could not advocate their use unless instructions were given in their upkeep. He thought the day was past for anything but water-closets.

Schools.

Mr. Philip H. Webb, Licentiate R.I.B.A., introduced a paper on "Large Public Elementary Schools in Town Districts." In it the author gave some interesting comparative tables showing the allowances as regards accommodation, sizes, proportions, and other particulars relating to schools in England, America, and in Continental countries. He described in detail classrooms, cloakrooms, teachers'-rooms, conveniences, medical inspection, etc., and evinced a large amount of practical knowledge and research.

One of the most interesting papers written for the Congress was that by Mr. Reginald G.

Kirkby, F.S.I., A.R.I.B.A., and much regret was expressed by many members that time precluded fuller consideration and discussion. The subject was "The Design and Construction of Open-air Schools." The following is an abstract of the paper:—

"The systematic medical inspection of school children has thrown a lurid light upon the condition of child life in our large cities, and has compelled realisation of the fact that many of the children are handicapped in their school work, and do not make the progress that may be expected from them under the ordinary conditions of school life.

This inspection has clearly shown that some of the children are backward in their work through some physical defect, but were not so physically defective as to warrant their relegation to the ordinary schools for defective children. Others were not "backward," but were physically debilitated, and some of these in their desire to maintain their progress sacrificed their health in consequence. For these classes of children the open-air treatment was adapted with startling results. Instead of sitting in badly-ventilated classrooms, they were virtually taken into the fields and made to lead an open-air life.

The system of open-air education for debilitated children may now be said to have passed through its experimental stage and to have now become firmly established. The beneficial results attending the experiment and the rapid growth of the movement have no parallel in educational work of recent years.

Children suffering from consumption are now sent to open-air recovery schools, owing to the absence generally of consumption hospitals for children in this country.

Such children, of whom there are a large number, should be treated in specially-designed buildings of a residential character, apart from open-air teaching schools.

So great are the benefits to be derived from daily attendance at open-air schools for a short period of three to six months that any expansion of the system should be on the lines of duplicating such schools rather than in providing schools of a residential type.

The children usually remain at school for the whole day, which necessitates some provision for the supply of meals, and this should be taken into account in the planning of an open-air school.

These schools are usually closed for the winter months, thereby simplifying their planning and construction. So good, however, were the results which attended the keeping open of the Bradford open-air school at Thackley during the winter of 1909-10 that the desirability of extending their usefulness to the whole of the year is clearly shown.

This school is specially planned to meet this requirement, but it would not be practicable to do this with most open-air schools.

The primary object of such schools is to remove the handicap that surrounds debilitated children, to place them on a more equal footing with their fellows, and to give them a capacity for a fuller and richer life.

The children may in this way be saved from relegation into a school for the physically or mentally defective, and be prevented from becoming a burden to the community, possibly for life.

The medical aspect of the work should, therefore, be of first importance, and the building should be designed somewhat in the nature of a hospital. At the same time, the desirability of carrying on such work of a special educational character as is possible in an open-air school should not be lost sight of. Therefore a building to meet all the requirements of an open-air school should in reality be both a hospital and a school combined.

Whilst the local conditions of a particular district may call for some slight modifications in the construction of a building, yet the principles of planning should be generally maintained, and the following requirements should be met:—(*a*) Daily rest and sleep; (*b*) provision for teaching in classrooms in wet weather, as well as teaching in the open air; (*c*) physical exercise; (*d*) bathing; (*e*) meals; (*f*) accommodation for medical inspection; and (*g*) the usual offices, which should be specially constructed to meet the requirements of an open-air school."

The author then described at length the question of site and the various departments required in the buildings.

"*Resting-sheds.*—The prescribed daily rest in the open air will necessitate the provision of deck-chairs, specially constructed so as to allow of the children lying in a much more recumbent position than is possible in ordinary deck-chairs.

During the warm dry days, the children could wrap themselves in rugs and lie on the ground, but this would not, of course, be possible in wet weather.

For rainy days some necessary protection overhead during resting-time will be required, and for this purpose large, open resting-sheds should be provided. These might consist of a roof open to the apex, supported on piers to allow the free circulation of air. It would be an advantage to have the back and one side closed in to give some protection against rain and strong cross winds.

Physical exercise in dry weather would naturally be conducted in the open air, but on rainy days, and particularly in winter time, the resting-sheds would adequately meet this requirement.

Classrooms.—The planning of the classrooms for formal academic instruction calls for special consideration, as it is essential from the nature of the school that this should be given practically in the open air, although in classrooms; at the same time it is necessary to provide sufficient classroom accommodation to house all the children at one time.

At Thackley the classrooms are arranged in two blocks, each consisting of three classrooms, for boys and girls respectively. The floor area is on a basis of 20 ft. per child instead of the usual 10 ft. required for elementary schools. Adjoining and opening out of each classroom is a teaching verandah, to which the teacher may take the children out for instruction even on rainy days, providing, of course, the weather is not too cold. The verandahs are protected from the north and westerly prevailing winds and rains.

Baths.—It is necessary to provide sufficient bathing accommodation to allow of each child being bathed at least once a week. A bath-room to accommodate up to twenty at one time would appear to be sufficient for a school of from 100 to 150 children. Shower-baths appear to be the best, as they allow the water to run away from each child, and so reduce the risk of contagion from any disease. Troughs might be provided in which small children could paddle, as the effect of the shower might cause the very little ones to dislike the bath. The showers should be just above the children's heads, with a separate ring-spray for each child. Each section of three or four showers should be under separate control, and all fitted with a regulating thermometer valve, so that water can be supplied to any desired temperature. The walls should be lined with white tiles or brick, the room well lighted and ventilated, and everywhere the idea of cleanliness should prevail.

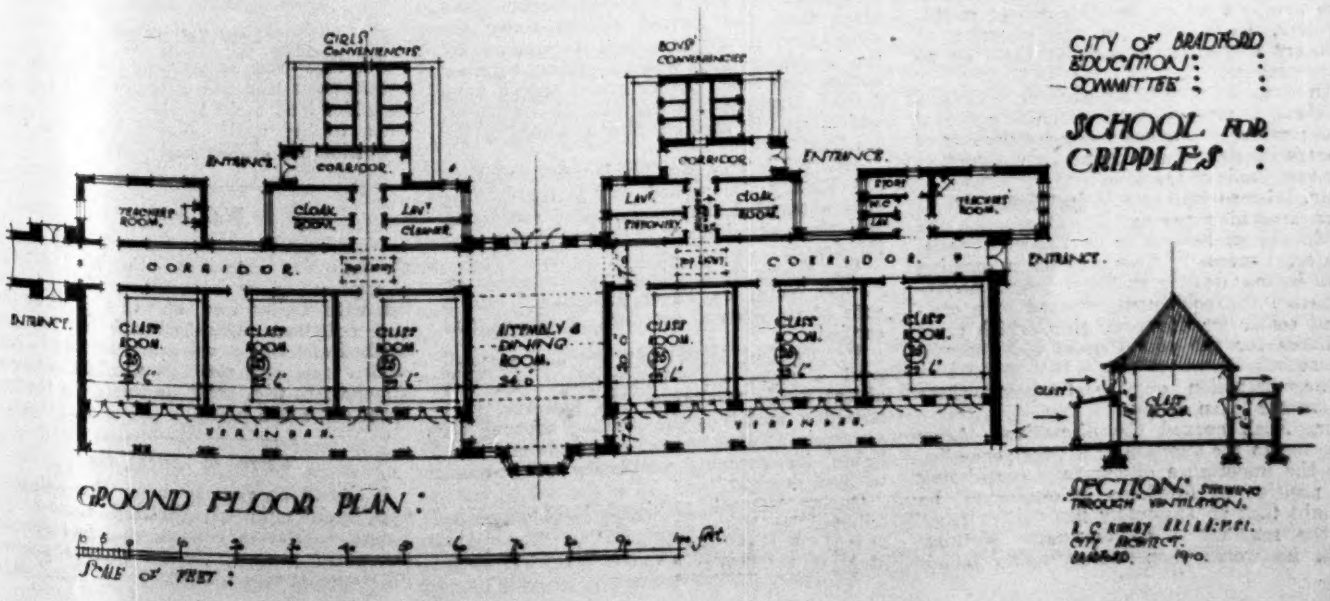
Meals.—The accommodation necessary to provide for the daily meals should be centrally placed in the buildings, so as easily to serve all departments, and should include dining-room, large kitchen, storerooms, larder, etc. The kitchen should provide sufficient accommodation to enable the three daily meals to be prepared and cooked, and should be provided with a large scullery, as, in addition to the ordinary work of preparing the meals, the children will assist in turn in the preparation and cooking of the food, and also in washing up the dishes, etc.

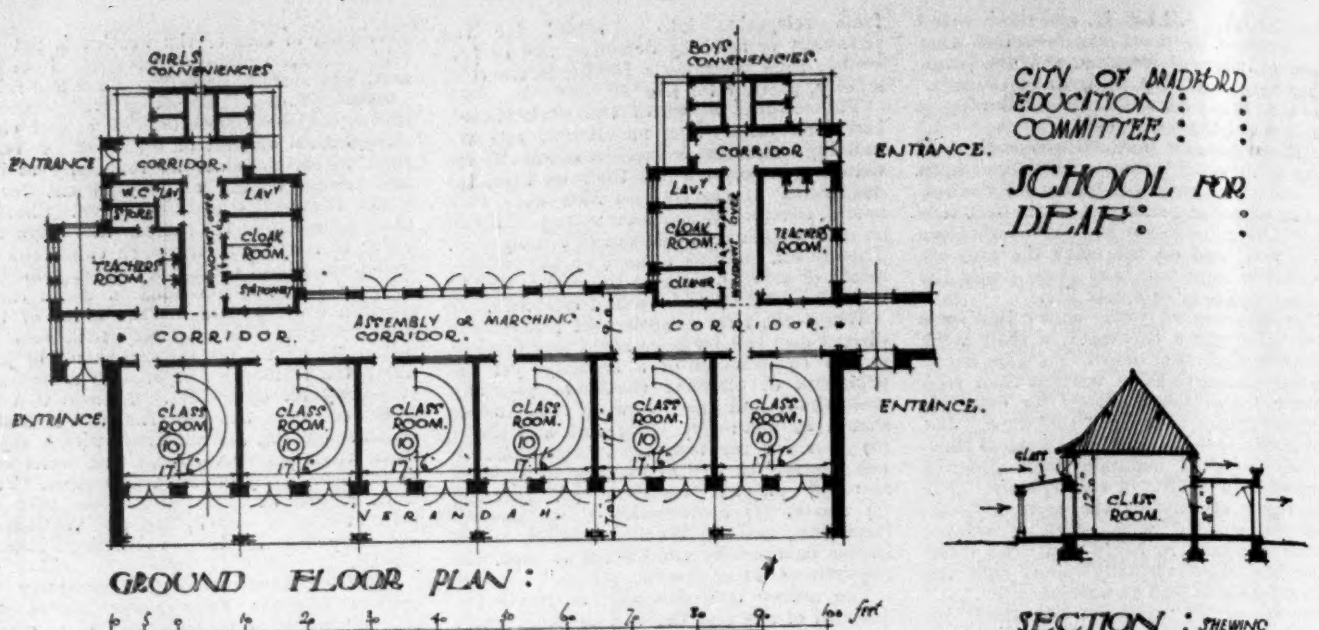
The dining-room should be capable of seating all the children at one time, with ample space for passing between the tables, so as to enable the children to be taught to lay the tables and provide for those who take part in serving at the table.

The dining-room and its adjuncts should comprise a separate block, as it is not desirable that the smell of cooking should reach the classrooms, etc.

It is necessary that the cloakrooms and lavatories should be well lighted and ventilated, as if these precautions are not taken the atmosphere of these rooms is likely to become very foul.

Construction.—The buildings which have been specially erected for the use of the open-air schools have hitherto been more or less of a temporary character, consisting chiefly of wood framing covered with boarding or sheet-iron. This temporary character is, no doubt, owing to the fact that the open-air school movement up to the present has been "on trial," and authorities have not dared to erect permanent buildings whilst it was in its experimental stage. Now that the principles of open-air schools have been firmly established, a more permanent type of construction is necessary, as it has been found that it is not really economical to erect a temporary class of building for this purpose. From the nature of the work of an open-air school it is not essential, however, to adopt an expensive





type of construction, and some form of construction is desirable which is lasting, and yet not costly to build.

Connecting Verandah.—The importance of isolating the various blocks of buildings in a school of this description so that a free current of air can circulate round them cannot be too greatly emphasised. It is equally important that these blocks of buildings should be connected by a paved covered way, enabling the children to be under shelter whilst passing from one block to another.

In view of the overwhelming evidence that exists to-day in favour of a more rational type of school planning, it is surprising that the authorities are still permitting school buildings to be erected on the old central-hall plan. It seems as if on the one hand we are breaking down the general physique of the race, and on the other hand having to erect open-air schools to build it up again.

During the last ten years many millions of pounds have been spent in the erection of school buildings in England, the bulk of which have many serious drawbacks from the standpoint of hygiene.

By their convincing success the establishment of open-air schools will help to break this ignorance down, and justify the wider adoption of the principles which they connote.

The additional cost of maintaining open air schools may militate against their expansion. Against this, however, it should be remembered that many children who ultimately find their way to permanent schools for the physically defective might have been saved this by early treatment in the open-air school, and so the greater burden and expense to the community would have been obviated. The principle of an open-air school might, however, be adopted in the planning of ordinary elementary schools at little or no extra expense.

An extended application of these principles is bound to meet with the ultimate approval of the nation at large as a sane application of those principles which make for the highest and best needs of the race."

Mr. Edward Willis, A.M.Inst.C.E., F.S.I., introduced his paper on "The Conversion and Equipment of Schools to be Used as Special Subject Centres." This was an interesting contribution, dealing with the general accommodation and equipment required in a combined centre for thirty-six girls, which gives facilities for the education of 360 students per week.

The discussion on the foregoing three papers was taken *en bloc*.

Dr. Nash opened the discussion. After referring to the question of fittings generally, and the importance of carefully considering the position of fireplaces in classrooms, he thought that an absolutely flat wall in front of the scholars to be essential. Nothing could be worse than broken lights facing a child, and cross lights he considered deleterious.

Mr. Osborne Smith believed there was room for great improvement in the position of cloakrooms. Cloakrooms opposite classrooms were objectionable, as the smell of damp clothes permeated the corridors. He strongly deprecated school authorities purchasing costly fittings, and suggested that the boys should be taught to make them under tuition. The system of "touching the button" was too prevalent in many technical schools. In his opinion a thoroughly good school answering all practical purposes should be erected at about 6d. per foot cube. He inquired why the corridors shown on the plan of the Wimbledon school were so wide and the staircases so narrow.

Alderman Carden paid high tribute to the Bradford open-air school. In Brighton it had been decided to adopt the Staffordshire system. All artificial arrangements of ventilation must be discarded. In Brighton they would build a school at 15*l*. per head, with all the classrooms on the ground floor.

Dr. Smith regretted that some architects studied the architectural aspect of their schools first and placed the planning in a secondary position. He thoroughly agreed with open-air schools, and thought the Staffordshire type to be the most satisfactory. He urged the architect to collaborate with the school medical officer before plans were settled.

Mr. Darch advocated a standard unit of light for each desk in a classroom.

Dr. Fremantle thought it was essential to aim at a simple type of school, without ornamentation. It was too late to discuss plans after they had arrived at the committee stage; they should have been thought out by the architect and medical officer together before that time. Every school should have a room large enough for medical inspection, which could be used on other occasions by the teachers.

Mr. Willis and Mr. Webb briefly replied. Mr. Kirkby also replied, and stated that he always adopted the suggestion of conferring with the medical officer in the initial stages of the design.

Mr. Saxon Snell introduced his paper on "Some Notes on Fever Hospitals," and a vote of thanks was proposed, seconded, and carried.

Dr. Symons, M.D., D.P.H., was to have read a paper on "Ventilation," but was absent owing to illness. He, however, submitted a model to the meeting showing an arrangement of combined casements and fanlights for ensuring ventilation of a room without draught.

During the week, evening lectures were contributed by Mr. Arthur Newsholme, M.D., D.P.H., R.C.P., and by Mr. Alexander Hill, M.A., M.D., F.R.C.S.

INTERCOMMUNICATION COLUMN.

Spiral Pillars.

Being interested in the subject of the origin and meaning of the spirally-treated pillars which are occasionally found in ecclesiastical buildings, *e.g.*, the well-known Prentice pillar in Rosslyn Chapel, I should be much obliged if any of your readers could add any examples to the following list:—

Durham Cathedral, two pillars, with spirals on east side of south transept (the *Builder*, June 3, 1893).

Norwich Cathedral, two spiral pillars in nave (Winkle's Cathedrals).

Canterbury Cathedral, three spiral pillars in crypt (Winkle's Cathedrals).

Waltham Abbey, one pillar with spirals (the *Builder*, April 2, 1898).

Dunfermline Abbey, one pillar with spirals (*The Scottish Nation*, by W. Anderson, 1860, Vol. 1, p. 103).

Compton Martin Parish Church, Somersetshire, one fluted and moulded spiral pillar in nave arcade

Clyst St. George Parish Church, Devonshire, one moulded spiral pillar in nave arcade, which is said to have been introduced in the last century to recall the story of the Prentice pillar.

These examples are not floriated like the Rosslyn shaft, but they all have *spiral* lines, and that is the distinguishing feature it is wished to trace in the pillars of other churches. I. HOUGHTON SPENCER.

Lead Soil Pipes.

Are lugs—such as cast-iron stack-pipes have—cast upon lead soil pipes, or is it sufficient to solder lead tacks to the soil pipe and nail them to the wall? May I also ask for a definition of a drawn lead pipe?

PLUMBING.

W.C. Joints.

Would one of your readers kindly answer the following questions:—Should the joints of iron soil pipes be caulked with tow and run with molten lead, or will a joint of tow and red lead suffice? Which is the best method of fixing a valve apparatus to a lead siphon trap, and also how should the trap of a stoneware w.c. basin be joined to the lead branch of a soil pipe? SANITARY.

Weight of Cement, etc.

I should be glad to know the weight of one bushel of:—(1) Portland cement; (2) Keens or Parian cement; (3) fine plaster; (4) coarse plaster; (5) fine granite plaster; (6) coarse granite plaster. S. P. B.

THE
BUILDER.

SEPTEMBER 24, 1910.

TO CORRESPONDENTS.

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All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 19s. per annum, with delivery by *Friday Morning's Post* in London and its suburbs.

To Canada, post-free, 21s. 6d. per annum; and to all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

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MEETINGS.

SATURDAY, SEPTEMBER 24.

Institution of Municipal and County Engineers.—Midland District Meeting at Redditch.

Northern Architectural Association.—The meeting announced to be held at South Shields on this date has been abandoned.

MONDAY, SEPTEMBER 26.

Glasgow Technical College Architectural Craftsmen's Society.—Visit to Locharbriggs Quarries, Dumfries, by permission of Messrs. Baird & Stevenson.

FRIDAY, SEPTEMBER 30.

Glasgow Technical College Architectural Craftsmen's Society.—First meeting of the session. Mr. W. A. Kemp, C.E., on "Railway Tunnel and Viaduct Construction." 8 p.m.

SATURDAY, OCTOBER 1.

Manchester Society of Architects.—The visit to Leeds will take place on this date, instead of on the 24th inst., as previously announced.

FIFTY YEARS AGO.

From the *Builder* of September 22, 1860.

The Fountain of St. Michael, Paris.

THE fountain of St. Michael is placed at the fork of the new Boulevart, Sebastopol, facing the bridge of St. Michael. Its height is not less than 26 metres, and its width 15 metres. It was commenced in the month of June, 1858, and was inaugurated on the 15th of August last. It is raised upon vaulted cellars, constructed of rubble work and Portland cement. The basement, 6m. 40c. high to the base of the columns, is formed of Saint Yllie stone (Jura): the rest of the monument is of the De Méry stone. The four stages for the water-fall and the basin are executed in Saint Yllie stone: the border of the lower basin raised only 30 centimetres above the level of the footpaths. At each extremity of the lower stage are two pedestals, supporting apocalyptic animals vanquished by angels. In the basement, two pedestals on each side serve to support columns. The panel between each pair is ornamented with a tablet of grey Breccia marble, cut in facets. In the niche, and above the topmost stage, is a group of St. Michael subduing Satan. This group is 5m. 50c. high: it is supported by a rock of stone from Soignies (Belgium). This rock, from which the water flows, covers a cast-iron reservoir, that serves for support to the group, and supplies the fountain at the rate of 23 litres a second. The spandrils of the niche are ornamented with chimeræ: the arms of the town of Paris, with the legend, "*Fluctuat nec mergitur*," are sculptured upon the key-stone. On each side of the niche are two columns, of the red marble of Languedoc, having their bases and capitals of white veined marble. The entire height of the columns is 6m. 20c. In the intervening panel is a sort of buckler in bronze, bearing upon a field of bees an N., surmounted by an imperial crown, and surrounded with sceptres and branches of oak and laurel. The cartouche below is ornamented with the head of an angel and a plaque of *lapis lazuli*.

The frieze of the entablature is decorated with small angels, bearing garlands of flowers: an escutcheon, with a lion's head upon it, is placed above each column. Over the columns, and in the following order, commencing on the left-hand side, are placed four statues, representing the cardinal virtues, Prudence, Strength, Justice, and Temperance: their height is three metres, including the plinth.

ILLUSTRATIONS.

St. Paul's and St. Paul's Bridge.

SINCE the Great Fire provided opportunity for Sir Christopher Wren's plan for making London one of the most beautiful of capitals public opinion has seldom been so much directed as at present to the architectural aspects of the Metropolis. Much water has flowed under London bridges since petty considerations procured the abandonment of this design; it was one of Wren's earlier efforts, and the remainder of his long life is measured out by the processes of the design and erection of the Cathedral as we now possess it, differing widely from, but I venture to think more noble in form than, the idea of the St. Paul's of his London plan. The increase of all that indicated metropolitical power since then need not be dwelt upon. The City of to-day is as different from that of the morrow of the Fire as it is from Wren's plan, but the Cathedral building has not had to sacrifice its suitably grandiloquent proportion to the vast increase of the surrounding mass; that it is still a sufficient visual embodiment of London is a testimony to the vitality of its architecture. In terms of monuments, as Egypt is the Great Pyramid, Constantinople St. Sophia's, or Rome St. Peter's, so St. Paul's is London. The position of the Cathedral upon the hill rising quickly from the river bank, the cliff-like length of its nave and presbytery walling, and the breadth and beauty both of the curves of the dome and of the sweep of the river, all contribute to the value of St. Paul's to the London landscape. Neither the Tower or Westminster Abbey, noble and more ancient as they are, enter into even momentary rivalry with it (though significantly and piteously enough the Tower Bridge has recently come to stay as an unmistakable landmark).

The Corporation of the City have with true instinct named beforehand the new St. Paul's Bridge, and its decision to place a continuous north and south thoroughfare at the Cathedral heart of the City will be accepted only with wonder at its long delay.

So far as known to the general public, the new bridge, which, being modern, should be of ferro-concrete, proposes to cross the river, continue at a high level above Upper Thames-street, and crossing Queen Victoria-street on a viaduct create a causeway to the top of the hill at St. Paul's Churchyard. The architectural possibilities of this scheme are decidedly promising and of great importance to the City, revealing, besides the new light of a north and south thoroughfare, the value of the central area enclosed by the river's curve in Southwark, so near and yet so far off. The preliminary scheme indicates that the east end of St. Paul's Churchyard is to be continued directly southwards as the approach to the bridge, thus passing under the apse of the Cathedral, which would fall into the line of frontages on the western side. As this line of approach seems to be open to improvement on architectural and practical grounds, and hoping to be in good time, as a Bill has yet to be promoted, I venture to make a suggestion on the subject of the direction of this new street from the Cathedral to the bridge based upon two grounds, firstly architectural, secondly practical.

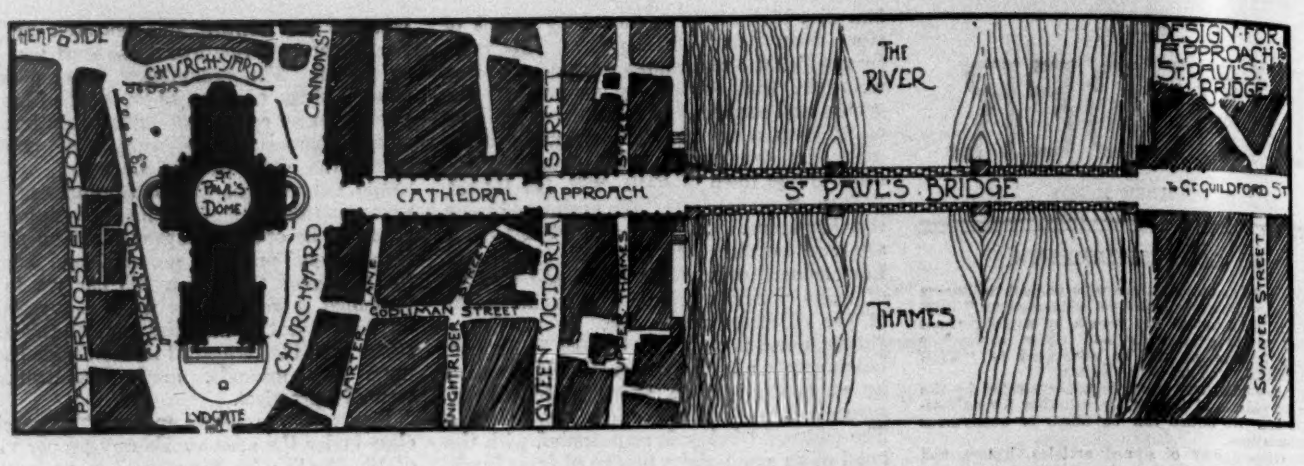
Firstly, the proposed approach by passing close under the apse avoids any proper view of St. Paul's; its direction has no proper architectural relation to the lines of the Cathedral, and makes no use of its wonderful mass. A slight alteration of the direction of the bridge at the northern bank can be effected, which will make the dome and southern transept pediment central with the new street, the wide new causeway continuing at a practical level (proposed to be slightly above the Churchyard) up to the beautiful circular southern porch.

I do not believe the City authorities to be either ignorant or ashamed of the great beauty of their Cathedral group, but their new bridge approach should not resemble Cheapside, which leads towards, but is blind to the greatest building in the Empire, but be rather like Ludgate-hill, which glorifies it, or even, as modern Cannon-street, use and enjoy it, though but accidentally. I have placed the architectural aspect first for conscientious reasons, the expedient practical suggestion comes next.

Secondly, the assistance given to traffic approaching the bridge across the City will be greater if the new street does not impinge upon Cannon-street at right angles at the east end, where it joins the angle of St. Paul's Churchyard, but is placed midway on the south side, where the curving direction round the east of the Cathedral affords room to mingle with the stream going to and from Cannon-street east and west. The point of approach to the new bridge would thus be placed upon the axis of the Cathedral at the transept advantageously to the usefulness of the new street. The viaduct over Queen Victoria-street may also gain a little height by the consequent shifting down the hill.

I believe no finer view can be created to-day in Europe of any first-class monument than this new one of St. Paul's from the bridge and its approach. Since the Great Fire and Wren's plan no such chance has come to London. The artistic composition suggested by a great bridge, a dignified causeway, picturesque variety in the levels of the streets, on the hill side, and the great dome group, affords material for a vision that a Piranesi in his most imaginative mood might envy. Its realisation would be worth some sacrifice, but difficult though it may be to persuade a modern generation to think architecturally, it should not be impossible to induce it, on this great opportunity, to achieve a magnificent and world-famous result by a rearrangement of the factors of expense and space already contemplated by the City Fathers.

The drawing now published was exhibited at the Royal Academy this year as an attempt to suggest the important elements of grouping which exist in the scheme of an approach to the Cathedral on the axis of its dome and transepts. The effect of its central mass filling the end of the approach from the bridge is sketched as in a diagram to illustrate the advantages of the position rather than to show the effect of the group from the bridge itself; this, with its constantly increasing scale on approaching, would not be properly realisable in one drawing.



The artistic elements added by the Thames, the grouping of London and its monuments, offer fascinating suggestions which it would take a Piranesi to realise.

A. BERESFORD PITE.

St. Anne's Church, Royton, Oldham.

THIS very characteristic design by Mr. Temple Moore was noticed in our review of the architectural drawings at the Royal Academy on May 14 last.

No. 4, Wimpole-street.

THIS house is, we are informed by the architect, Mr. W. H. White, planned on the lines typical of the West-end professional residence.

Porte du Roi, Mont S. Michel.

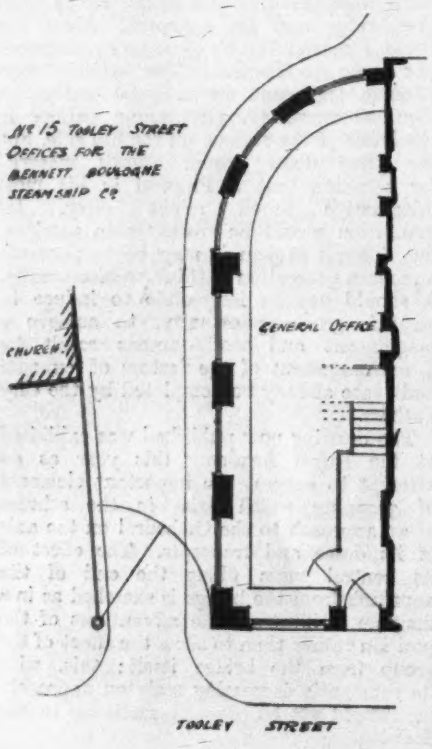
THIS picturesque archway spans the one street of the island at its lower end near the "Poulard Aîné." The stairs on the left lead up to the ramparts, from which the ascent to the abbey is usually made. The building over the archway is now used as a school.

The etching was exhibited at the Royal Academy and at the Royal Society of Painter-Etchers in 1908.

WILLIAM ANSELL, A.R.E., A.R.I.B.A.

Offices, 15, Tooley-street, for the Bennett Boulogne Steamship Company.

THIS block of offices forms the completion of the company's premises in London, which consist of a wharf, warehouse, landing space, etc. The building consists of six floors and a large basement, which extends under the loading way. The elevations are in gauged brickwork with Portland stone dressings. In order to get the character of a shipping office into the design, similar buildings, of which there are so many in Holland and at Boulogne, may be said to have supplied the "motif." The architect is Mr. S. D. Adshead.



LONDON MASTER BUILDERS' ASSOCIATION.

Monthly Report.

A LARGELY-ATTENDED Council meeting was held at 31 and 32, Bedford-street, Strand, W.C., on Thursday, the 15th inst., when the President (Mr. Leonard Horner) took the chair.

Reports of the Carpenters' and Joiners' and Plasterers' Conciliation Board meetings were submitted, together with reports from the Finance and Emergency Committees. Reference was made to the occupancy of the new offices at Koh-i-Noor House, Kingsway, W.C., which takes place on Friday, the 23rd inst., and to which address it is requested that all communications be sent. The future publication and circulation of the Association Diary and Handbook were considered, and instructions were given in connexion therewith in order to make it as useful as possible, not only to builders, but also to architects, as the latter now have copies posted to them. The L.C.C. submitted the draft of its suggested building regulations regarding reinforced concrete construction for suggestions and criticism. The matter was considered, and the Council of this Association referred it to a Committee of the whole Council for consideration and report at an early date. The action of the L.C.C. in drawing up regulations for this work was warmly welcomed by the members present, as it was felt that the carrying out of same would be performed by builders apart from the designing. Members were reminded of the Town Planning Conference to be held in London in October next (10th to 15th), and which they had been invited to attend. Other matters of importance were considered, and new members were elected.

MASTER BUILDERS' ASSOCIATIONS, etc.

Scottish Building Trades Federation.

The sixteenth annual meeting of the Scottish Building Trades Federation was held in the Building Trades Exchange, Edinburgh, on the 9th inst. Delegates attended from the principal centres of Scotland, and Mr. Hector MacVinish, Inverness, presided. The executive report on the past year was submitted by the Secretary, Mr. James Cameron, solicitor, Edinburgh. The report stated that another lean year in the building trade throughout Scotland had to be recorded, but there was a glimmer of hope of improvement in the near future, as several of the principal centres reported that trade was on the upward trend. Trade was, however, reported to be dull in Aberdeen, Paisley, Kilmarnock, Dundee, Airdrie, Coatbridge, Inverness, and Hawick. Edinburgh showed signs of improvement, while the brick-building trade in Glasgow was better than it had been for some time past. Plumbing, masonry, and joinery still continued dull. The financial report showed the finances to be in a satisfactory state. In some centres it had been reported that difficulty was experienced in getting apprentices, masons particularly, but it was thought that with an improvement in trade the necessary supply of apprentices would be forthcoming. The Secretary was appointed to attend the next International Conference of Secretaries, to be held in Manchester on October 19, and arrangements were also come to for a monthly exchange on matters of interest between the Scottish Building Trades Federation and the Building Federations of Germany, Belgium, Holland, and South Africa. The following office-bearers were elected for the ensuing year:—President, Mr. David Wilson, J.P., Edinburgh; Vice-President, Mr. James Farquharson, Aberdeen; Secretary and Treasurer, Mr. Cameron.

OBITUARY.

M. Just Lisch.

M. Just Lisch, Government Architect, Honorary Inspector of Historic Monuments, and Officer of the Legion of Honour, died in Paris last month. M. Lisch was a pupil of Vaudoyer and of Labrouste. During his long career as an architect he carried out a number of important works, among which may be mentioned the railway terminus at St. Lazare in Paris, and that at Havre, for the Compagnie de l'Ouest. He was Diocesan Architect for Amiens and Angoulême, and supervised the restoration of the house of Diana de Poitiers at Orléans, the Hôtel de Ville at La Rochelle, the Palais de Justice at Dijon, and a number of churches.

Reverend R. M. Fulford.

The death at Buckerell, near Honiton, is announced of the Reverend Robert Medley Fulford, vicar of the parish, in his 65th year. Mr. Fulford was the son of the Reverend F. L. Fulford, perpetual curate of Woodbury, near Topsham. He formerly practised as an architect, and was elected a Fellow of the Royal Institute of British Architects; he entered the offices, in London, of William White, and then settled as an architect in Exeter. Messrs. Fulford, Tait, & Harvey, of Exeter, were the architects of St. Andrew's Church, Paignton; Mr. Fulford made the designs for several churches and buildings in the south-west of England; for the additions—including the vestry, choir, organ chambers, porch, and south transept—to St. George's Church, Clyst St. George, Topsham, with the chancel roofs, stalls, screens, etc. (1888), and for the oaken reredos, in the XVth century style, St. Erth Church, Cornwall (1903). He entered Holy Orders in 1891, and a few months ago, being then vicar of Hennock, South Devon, was appointed to the vicarage of Buckerell.

BOOKS RECEIVED.

THE HOUSING ACTS AND TOWN PLANNING. By F. Howkins. Pp. 300. (The Estates Gazette, Ltd. 7s. 6d. net.)

PRACTICAL MATHEMATICS AND GEOMETRY FOR TECHNICAL STUDENTS. By Edward L. Bates and Frederick Charlesworth. Pp. 446. (B. T. Batsford. 3s. net.)

DINANDERIE. By J. Tavenor-Perry. Pp. 238. (George Allen & Sons. 21s. net.)

ENCYCLOPÆDIA OF MUNICIPAL AND SANITARY ENGINEERING. Edited by W. H. Maxwell, A.M.Inst.C.E., and J. T. Brown, M.R.San.Inst. Pp. 561. (Constable & Co., Ltd. 42s. net.)

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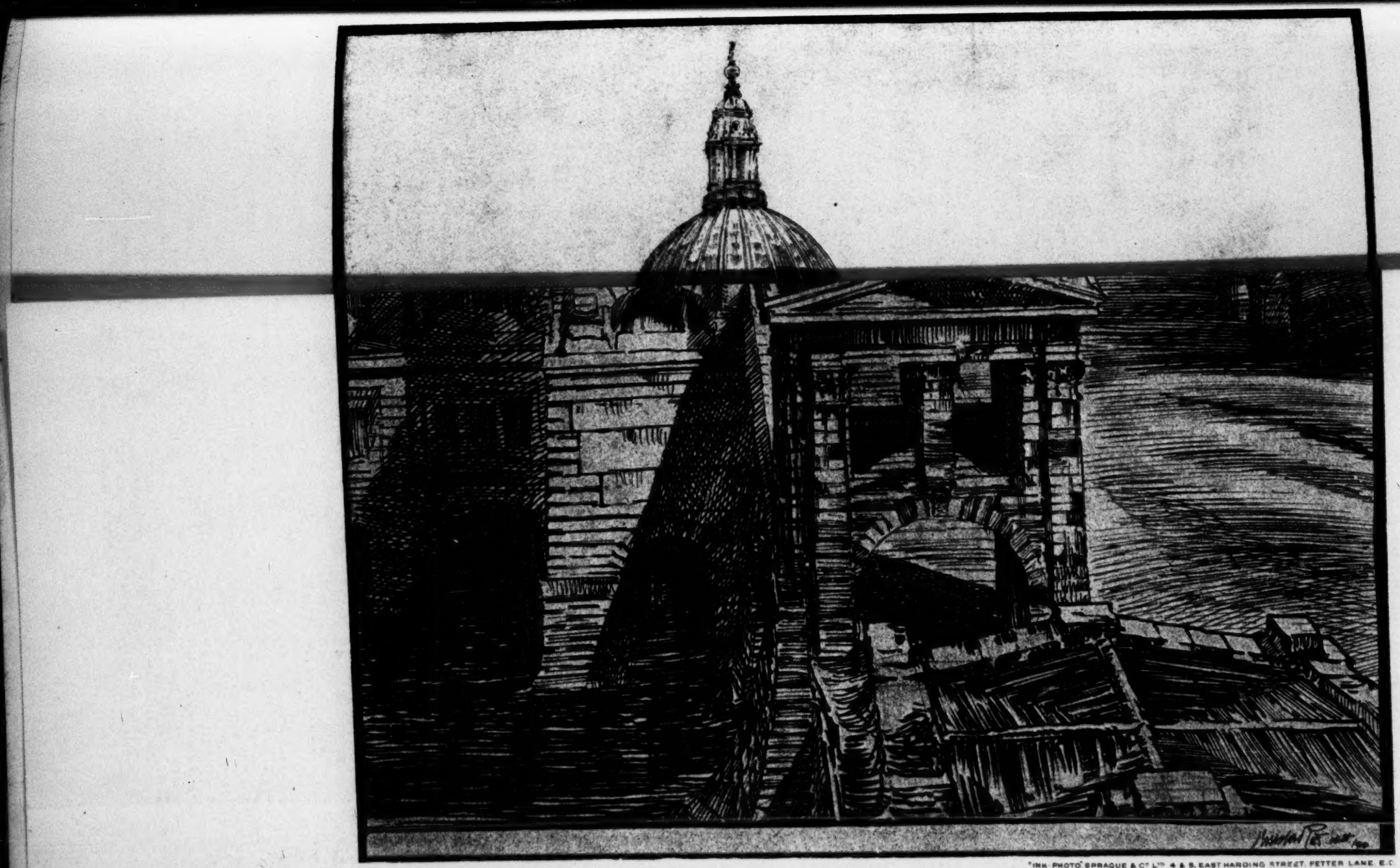

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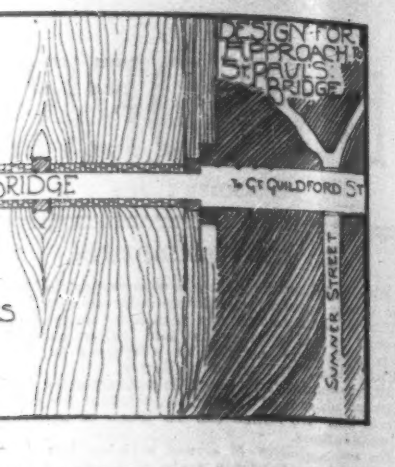
DESIGN FOR APPROACH FROM ST. PAUL'S BRIDGE.—By Professor Beresford Pite, F.R.I.B.A.

Royal Academy Exhibition, 1910.



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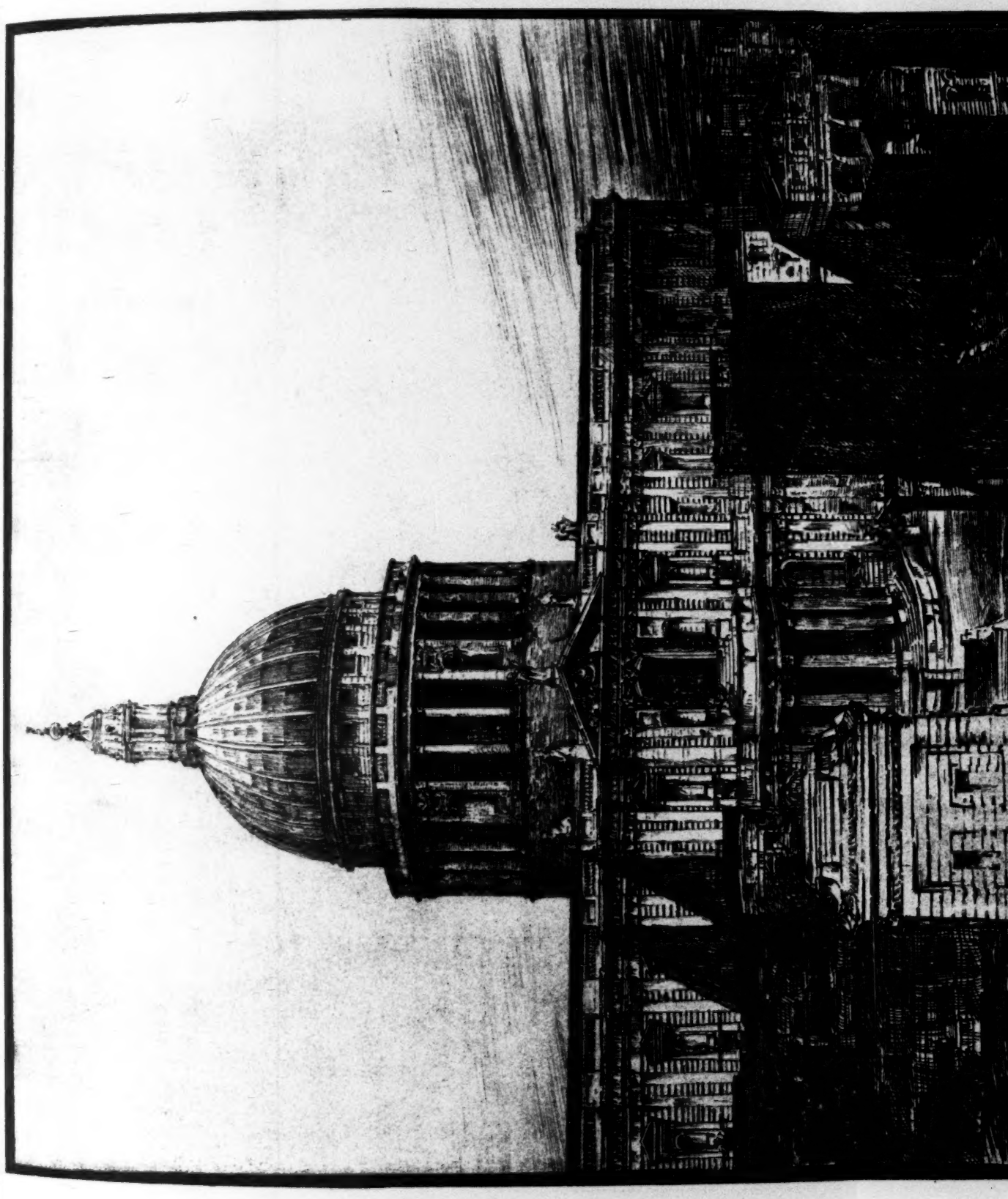

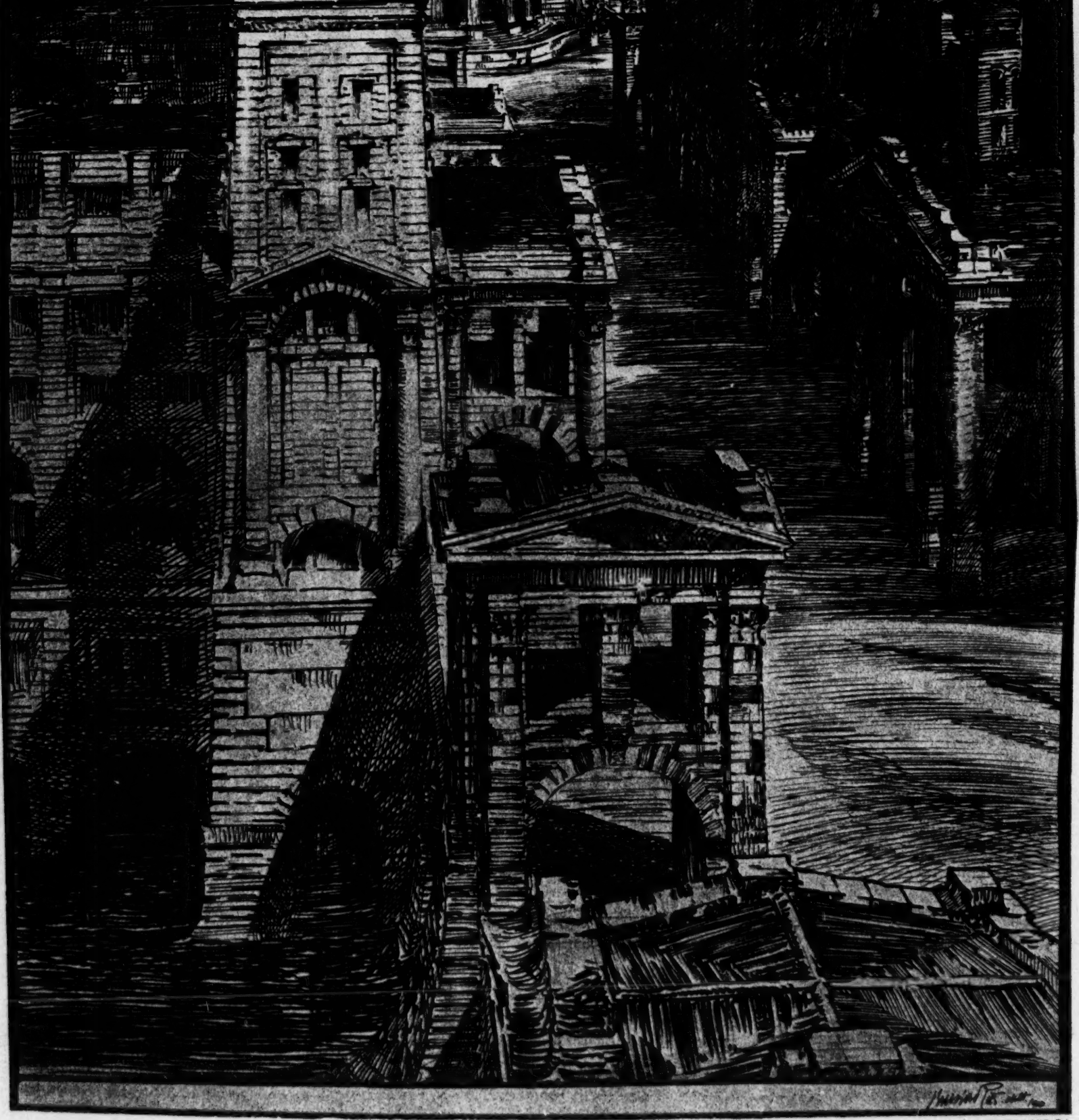

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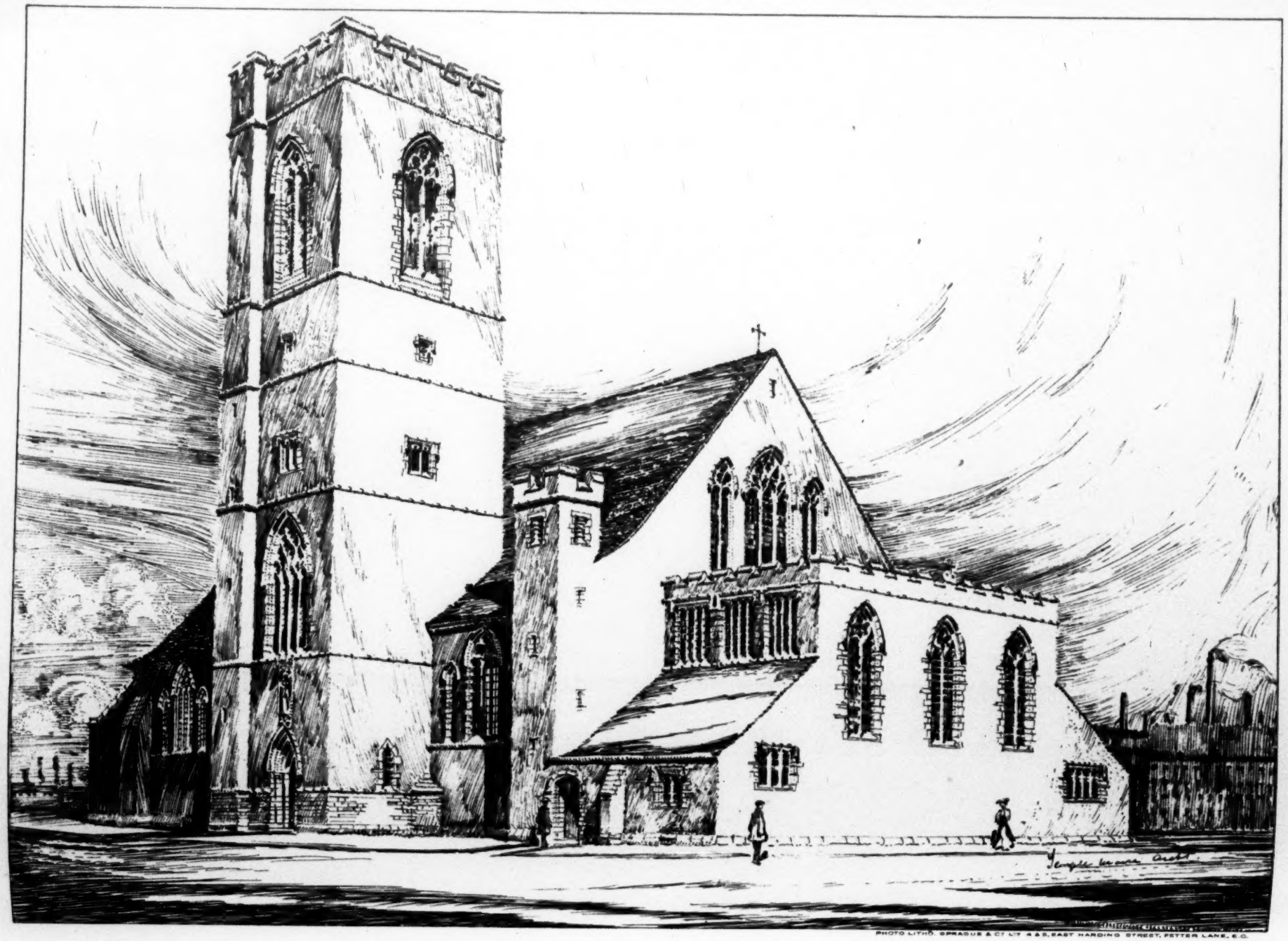
Royal Academy Exhibition, 1910.

DESIGN FOR APPROACH FROM ST. PAUL'S BRIDGE.—By Professor Beresford Pite, F.R.I.B.A.



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ST. ANNE'S CHURCH, ROYTON, OLDHAM.—Mr. Temple Moore, F.R.I.B.A., Architect.

N° 4 WIMPOLE STREET W

W. HENRY WHITE ARCHITECT
14 CHANDOS PLACE CAVENDISH SQ^RE W.

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Royal Academy Exhibition, 1910.

Royal Academy Exhibition, 1910. ST. ANNE'S CHURCH, ROYTON, OLDHAM.—Mr, TEMPLE MOORE, F.R.I.B.A., ARCHITECT.

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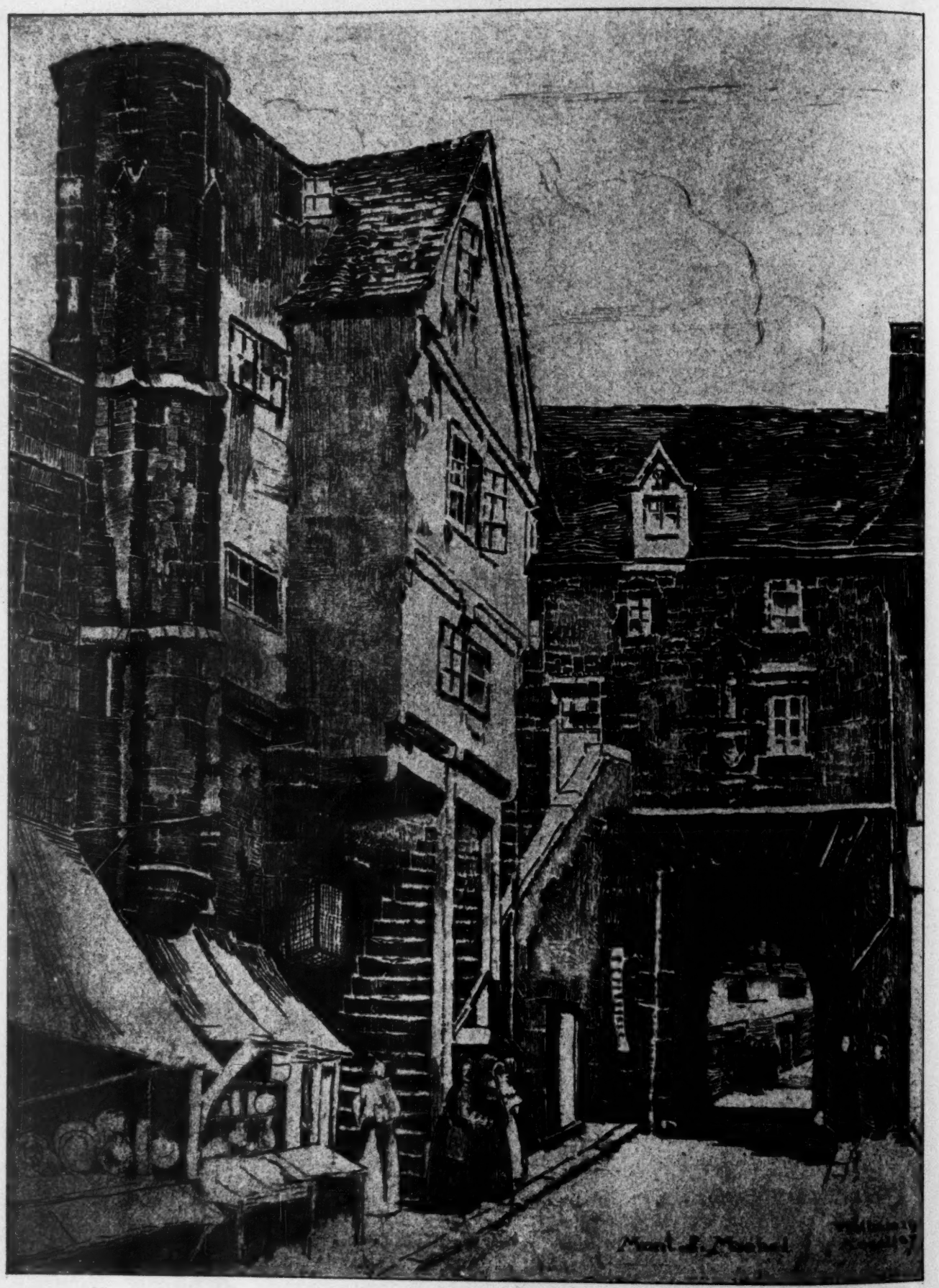

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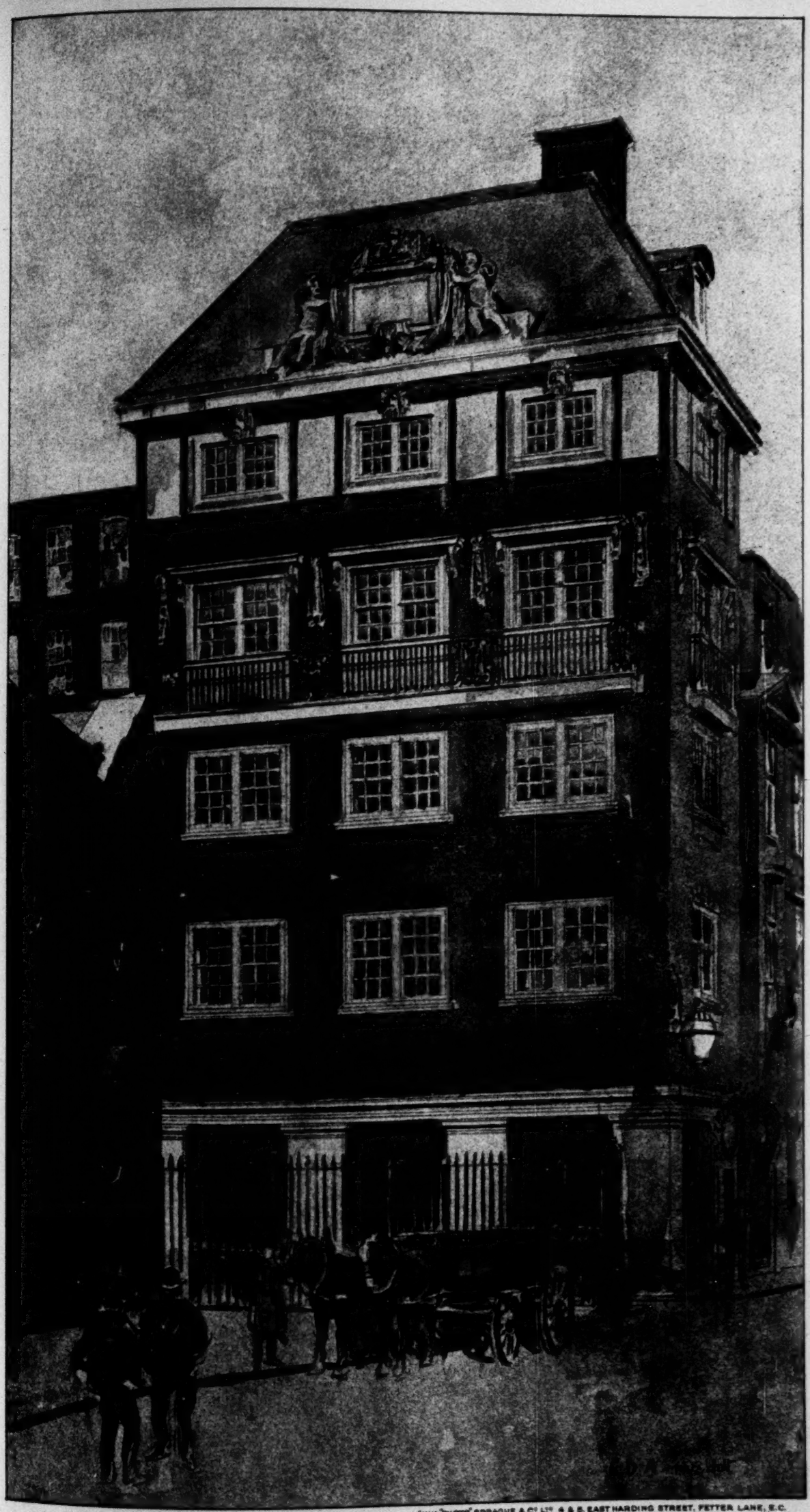
PORTE DU ROI, MONT ST. MICHEL.—By Mr. William Ansell.



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SHIPPING OFFICES, 15 TOOLEY STREET, S.E.—Mr. Stanley D. Adshead, F.R.I.B.A., Architect.

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MONTHLY REVIEW *of* ENGINEERING.

Fig. 1. New Treasury and Post Office Building, Kingstown, Jamaica.

REINFORCED CONCRETE BUILDINGS IN JAMAICA.

SINCE the recent disastrous earthquake in Kingstown the Government of Jamaica, in common with property owners generally, have made extensive use of reinforced concrete in order to secure immunity from the effects of earth movements and the serious fires which almost invariably follow such disturbances.

As our readers are aware, reinforced concrete lends itself specially to the design of monolithic buildings with raft foundations, calculated to offer great resistance to earthquake shocks by reason of the cohesion between all parts of the construction. Moreover, the proved value of the material in respect of fire-resistance is a strong recommendation for its employment.

Two buildings recently completed in Kingstown are described and illustrated in this article. One is a structure comprising accommodation for the Treasury and the General Post Office, and the other, known as the King's House, is intended for the residence of the Governor. Both of them were designed by Messrs. Nicholson & Corlette, of London, in accordance with the Coignet system of reinforced concrete, and the work was executed by Messrs. William Cowlin & Son, of Bristol, who have carried out a large number of contracts for similar buildings in Great Britain, including the important tobacco warehouses at Bristol for the Docks Committee of the Bristol Corporation.

Treasury and General Post Office.

The public building occupies an island site, bounded by King's-street and Peter's-lane at the front and back, and by Tower-street and Barry-street at the ends. It is three stories high, measuring 308 ft. long from end to end, by 88 ft. and 132 ft. wide. Fig. 1 is a general view from the junction of King's-street and Tower-street, giving a good idea of the portion occupied by the Treasury; and Fig. 2 is a view of the Post Office premises from the corner of Peter's-lane and Barry-street.

The superstructure is of the type usually adopted in tropical climates, colonnades and wide verandahs forming integral features of the design. The roofs are flat throughout, and covered with a good thickness of gravel in order to absorb the direct rays of the sun.

Beneath the whole building extends a general foundation raft of reinforced concrete, consisting of column bases connected by beams, and further connected by a continuous slab 8 in. thick.

All loads are transmitted by the columns to the bases and distributed over the raft by specially designed footings, proportioned to suit the load and other conditions in different parts of the building. Fig. 3 gives details of two typical column footings, also showing the disposition of the reinforcement in the columns and in the beams connecting the footings. In most cases the arrangement is similar to that shown in the left-hand details, but at certain points it has been found necessary for structural reasons to place the top of the footings at a level somewhat below the surface of the general raft, thereby leading to the special type of

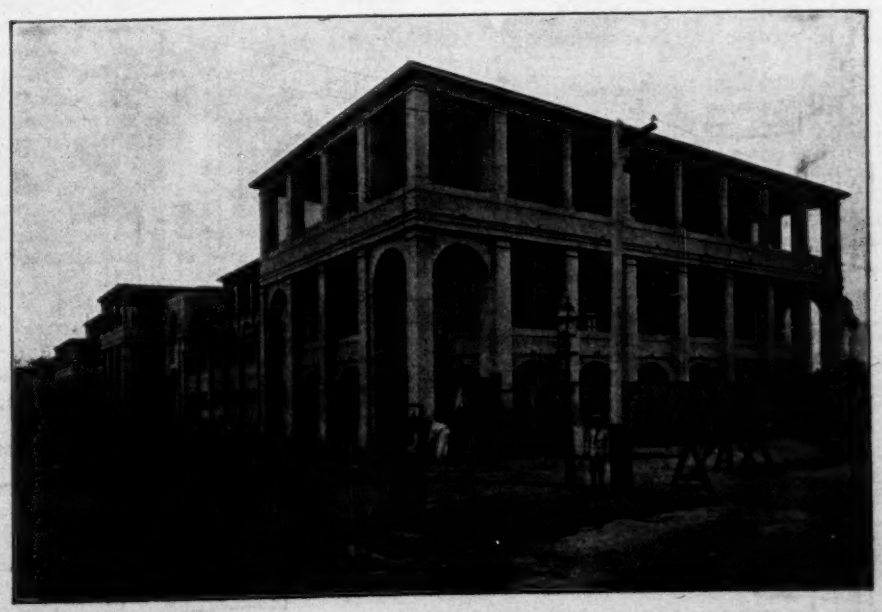


Fig. 2. New Treasury and Post Office Building, Kingstown, Jamaica.

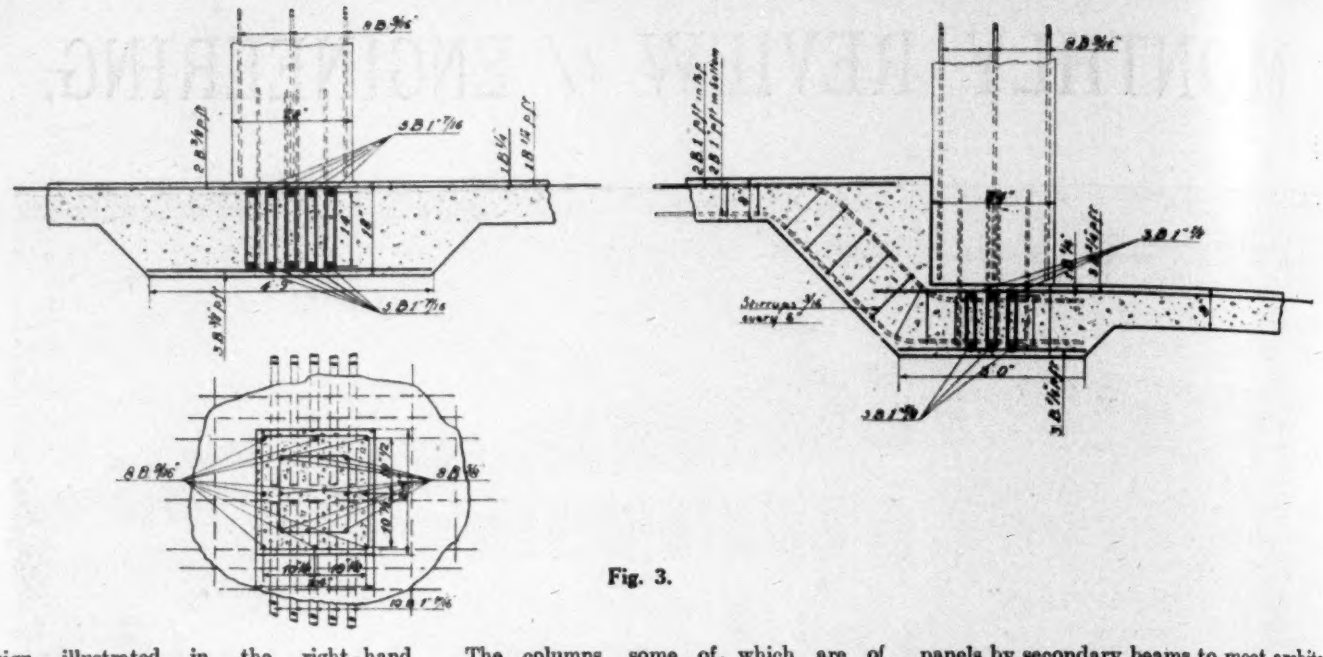


Fig. 3.

design illustrated in the right-hand section.

The superstructure consists of columns, beams, wall lintels, wall panels, floors, flat roofs, and staircases, all in reinforced concrete.

The columns, some of which are of octagonal cross section, vary from 24 in. square in the lower stories to 18 in. square below the roof. The average span of the main beams is about 20 ft., dividing the floors into square bays, further divided into panels by secondary beams to meet architectural requirements. The average thickness of the floor slabs is 4 in., apart from paving or other finish, the superloads being 150 lb. per square foot on the first and second floors, and 84 lb. per square foot on the roofs. As the design of the floors in this building is essentially similar to that illustrated in connexion with the residence of the Governor it is unnecessary to reproduce any of the working drawings.

Fig. 4. King's House, Kingstown, Jamaica.

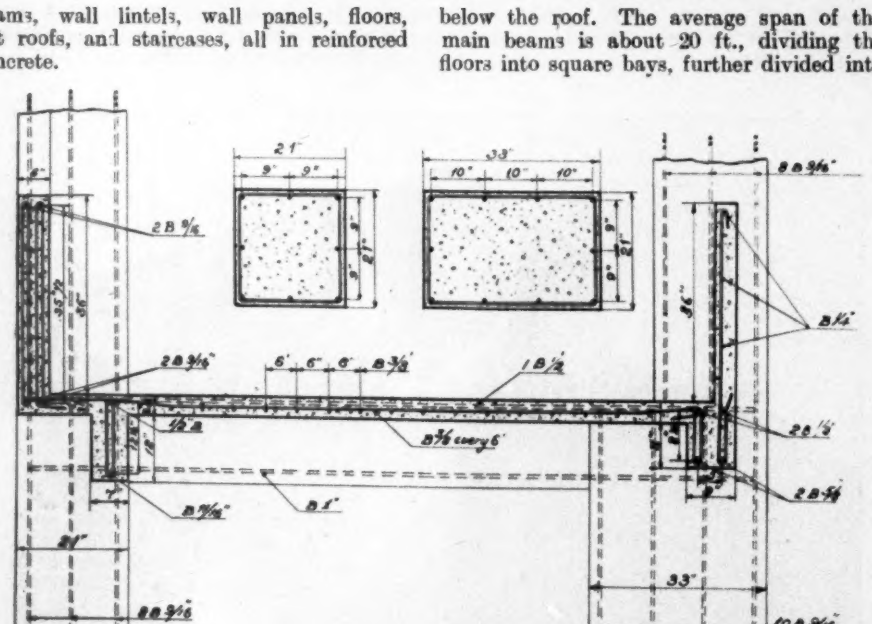


Fig. 5.

King's House.

Fig. 4 is a photographic view of the new residence for the Governor of Jamaica, a building with the maximum dimensions of 182 ft. by 158 ft., although, owing to the inclusion of projecting wings, a good deal of the ground space denoted by these measurements is left open. The house comprises a ground floor, principal floor, top floor, and terrace roof, and includes a large swimming-bath, as well as several fine apartments for public functions, the total area of flooring being about 17,000 sq. ft.

For the illustration of structural details we give in Figs. 5 to 7 some typical sections of column, floor, and wall panels. Fig. 5 shows the Coignet method of reinforcing columns, beams, wall lintels, and floor slabs. Fig. 6 represents, in addition, the construction of wall panels carried by reinforced concrete beams, and Fig. 7 contains, among other details, the cross section of a main floor beam.

As in the case of the public building, all

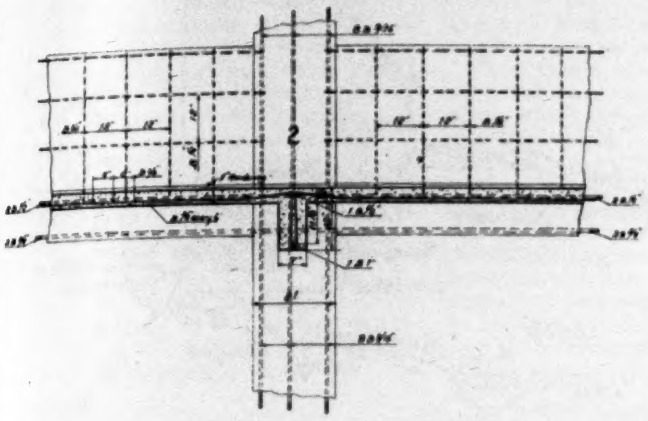


Fig. 6.

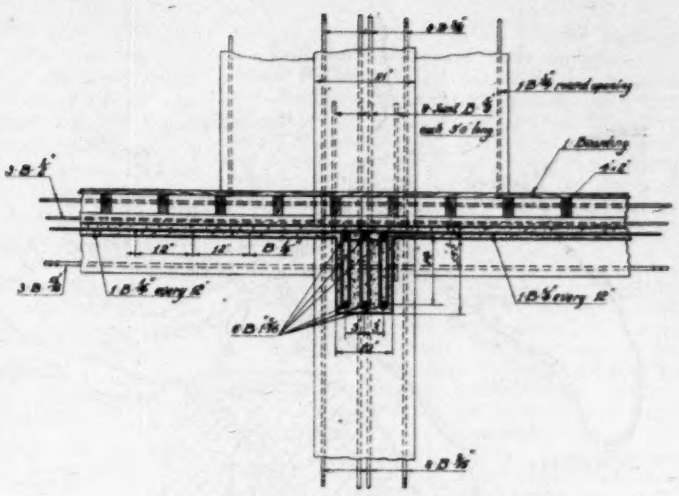


Fig. 7.

the reinforced concrete work in the King's House is monolithic, and the structure is founded upon a general foundation raft, as before described.

A noteworthy fact in connexion with the execution of the two contracts was that natives were employed throughout under the direction of a few experienced men. We are informed that these two buildings have afforded a striking example of economy as compared with construction in other materials, and that Messrs. Nicholson & Corlette have also prepared designs for the new Law Courts, for which tenders are now being obtained. The latter building will be somewhat similar in design to the Treasury and Post Office, and will occupy a site close to those departments, facing a large open space in the neighbourhood. Messrs. Edmond Coignet, Ltd., have been appointed as reinforced concrete specialists for the execution of the work.

PARIS FLOODS COMMISSION.

ALTHOUGH only appointed in February last, the Paris Floods Commission have already formulated a most complete series of recommendations in their official report, which takes the form of a folio volume of some 800 pages.

The subject of flood prevention and kindred matters are considered under twenty heads, but for the purposes of the present article we may regard the proposals of the Commission as belonging to two categories.

1. Those relating to measures and works capable of almost immediate realisation at moderate outlay, and calculated to afford some degree of protection against future floods.

2. Those foreshadowing works, of which the execution involves considerable expenditure of time and money, and which have for object the prevention of floods in the city of Paris and in the inner zone of suburbs.

Measures and works in Class 1 are partly of administrative and partly of structural character.

Dealing first with proposals relating to administration, we note the recommendations that the number of observers in the hydrometric and pluviometric service shall be doubled; that automatic instruments shall be provided for recording the readings of river and rain gauges in the Seine Valley; that a central hydrometric office shall be established at the central Telegraph Bureau in Paris in communication by means of automatic transmission apparatus with all local observation stations, and whence warnings and instructions could be issued promptly by telegraph and telephone; and that indicators shall be erected in prominent situations, such signals having dials capable of being illumined at night, so as to show at all times the level of the river and its relation to the levels attained during periods of flood.

Another administrative precaution suggested is to the effect that, in places where for æsthetic reasons the height of quay walls cannot be permanently raised, temporary watertight barricades shall be erected in time of flood. We are glad to be able to state that preparations for these barriers have already been commenced. The construction includes foundation slabs of reinforced concrete beneath the asphalt paving of the footpaths, the slabs having cast-iron sockets at the distance of 2 metres apart for the insertion of steel uprights. In case of danger, the uprights will be fixed in place and the barrier completed by planks protected by bags of cement piled upon the parapet of the quay wall.

In view of the immense inconvenience caused by the isolation and flooding of electric tramway generating-stations, the Commission recommend that all tramway companies shall be compelled to maintain ample quantities of coal and water, and that arrangements shall be made for the supply of current from other stations to those establishments which are not completely out of the reach of floods.

A further administrative reform of much importance is one compelling the inhabitants of Paris to comply with the Law of 1894, providing that all sewage shall be discharged into the main drainage system. At present little more than half the houses in the city are connected with the sewers, and during the last flood transport arrangements were absolutely paralysed, with the result that large quantities of night soil had to be thrown into the river. Any recurrence of this necessity is clearly inadvisable.

Finally, the authorities of suburban communes in the Seine and Marne valleys are invited to consider the adoption of measures for preventing the channels of the two rivers from being encumbered by obstacles, to study the best means of protecting their districts from floods, and to undertake the improvement of drainage systems which proved to be inefficient during the inundations of January last.

Structural works of protective character include some within the province of the municipal authorities and others to be undertaken by various public companies.

Unless effective means are adopted for diverting surplus waters from the sinuous bends of the Seine traversing Paris, it is absolutely necessary to raise the quay walls to the height of some 18 in. above the flood level of 1910, except at places where temporary barriers are contemplated as previously stated. Owing to consequent alterations in the level of adjacent streets the total cost of the works is estimated by the Commission at about 1,000,000*l.* sterling. But, supposing the construction of the relief channel, described later, the requisite modifications of the quay walls will be very much simplified and the expenditure reduced to less than 150,000*l.*

In connexion with quay improvements it is proposed that all openings in the walls now existing or made hereafter, shall be provided with closely-fitting doors or gates constantly kept in a state of efficiency.

To facilitate the flow of water generally it is recommended that various works should be undertaken for improvement of the Seine. The Commission advocate the complete remodelling of the narrow channel known as the Bras de la Monnaie, situated between the Ile de la Cité and the southern embankment of the Seine, the necessary works comprising the widening of the channel to 60 or 67 metres above the Pont Saint Michel, the reconstruction of the Pont de l'Archevêché, the Pont aux Doubles, and the Petit-Pont now spanning the same channel, the removal of the Chemin de Fer d'Orleans to the borders of the Place Saint-Michel, and the remodelling of the Monnaie weir, or preferably the complete removal of the barrage and lock.

It is also recommended that various floating establishments, useless for navigation, to the right of the Iles Saint-Louis and de la Cité, should be abolished, and that regulations should be drawn up to cope with the obstructions caused by prolonged occupation of quays and by the accumulation of moored craft in the river, particularly at the beginning of floods.

The main drainage system of Paris is already quite satisfactory under normal conditions, but data furnished by the floods of 1910 have led the Commission to the following conclusions:—

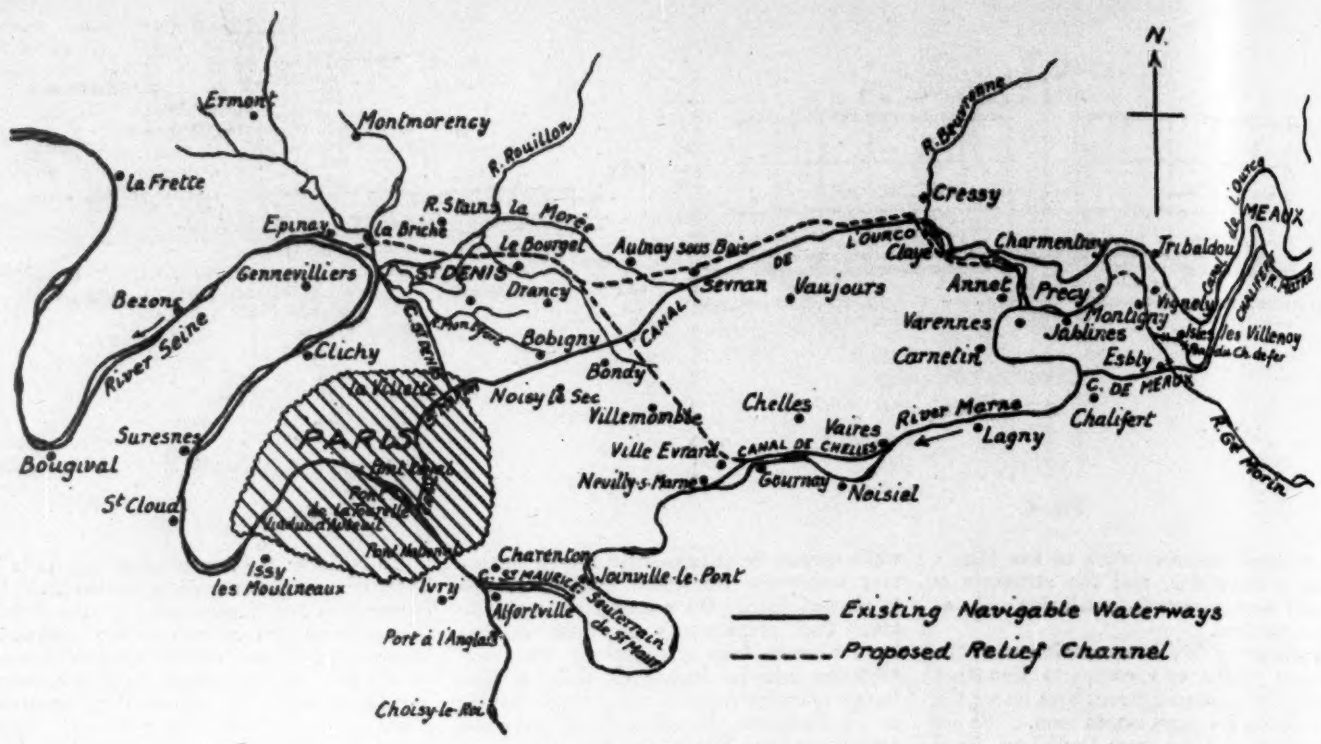
1. That it is desirable to provide watertight doors along the quay walls, and capable of being operated from the footwalks, for closing all openings made to receive rainwater drains in places where the tunnel of the Chemin de Fer d'Orleans has prevented direct communication with the main drains.

2. That it is necessary to provide valves, capable of being operated from street level, for cutting off from the remainder of the main drainage system those collecting sewers which are situated in parts of the city liable to be submerged by direct overflow of the river.

(3) That the Marceau collecting sewer should be duplicated as soon as possible with a siphon under the Seine, to receive drainage from Javel and Grenelle, and that the Debilly collecting sewer should be remodelled so as to reverse the direction of flow.

It should be noted that the Municipal Council have already authorised the expenditure of 116,000*l.* for repairs to the main drainage system, including duplication of the Marceau sewer.

Owing to their situation the sewage disposal works at Issy-les-Moulineaux, Saint-Ouen, and Vitry-sur-Seine were invaded by water or rendered inaccessible, the works at Romainville alone remaining in operation. To obviate the necessity of employing the river as a main sewer on future occasions, the Commission recommend that all new sewage works shall be always accessible and free from the risk of inundation, and that the four existing works shall be protected as far as possible and furnished with pumping machinery capable of keeping them free from any influx of water.



Proposed Canals, Paris.

To obviate future disorganisation of the telegraph service, the Commission recommend (1) alteration of the drains connected with and beneath the central office and the construction of a new section at higher level discharging into the main conduit of the Cité Martignac. (2) Having regard to the impossibility of hermetically closing the main cable conduits, they propose that these subways should be provided with intercepting chambers accessible by manholes from the street, and intersected by a high partition wall over which the cables would pass, and whose summit would be high enough to stop the flow of water from drains. (3) To prevent flooding of the basement, where are installed the generating converters, accumulators, and other electrical appliances, they recommend that this part of the building should be converted into a watertight tank by a complete lining of reinforced concrete. The approximate cost of these works is estimated at 94,000*l.*

The telephone service suffered very severely in January last, and it is disappointing to find that the Commission are able to hold out no hope of efficient protection, although their report suggests the adoption of measures which may ameliorate damage to some extent.

With respect to electricity stations, gas works, compressed-air stations, and the distribution systems in connexion therewith, the Commission make a series of recommendations chiefly relating to means of making the buildings capable of keeping out water, to the provision of pumping machinery, and to various precautions advisable for keeping subways free from water and for preserving the various conduits from injury as far as possible.

Considerable attention is devoted in the report to works on all railways in the vicinity of the river. It is proposed that walls and foundations should be rendered watertight and that adequate pumping plant should be provided for the removal of water. A barrier is recommended for protection of the Quai d'Austerlitz Station and raising of the existing wall along the line to Versailles. Additional pumping appliances are thought desirable on the Metropolitain system, and numerous suggestions are made with the object of avoiding interruption of the services on railways connecting Paris with other parts of France.

All the recommendations so far discussed appear to be wise, and in our opinion none of them should be lightly dismissed, although the extent of some works proposed may be somewhat curtailed if measures are to be taken for diverting or largely reducing the volume of future floods in the French metropolitan district.

Works directed to this end come within the second category mentioned in the early part of this article. Numerous propositions were submitted foreshadowing the construction of absorption wells, the construction of enormous storm-water reservoirs, the cutting of deviation overflow channels, the establishment of a maritime canal, and various other projects. After full consideration of these, the Commission have arrived at the conclusion that the most advantageous solution of the problem is to construct a canal joining the Marne and the Seine, commencing at Annet and ending near Epinay, as indicated in the accompanying plan. This waterway is quite practicable from the engineering point of view, and, in addition to serving as a most useful safety-valve, it would be of public utility as a means of navigation. The total cost of the work is estimated at 6,800,000*l.*, and by making the channel capable of passing 500 cubic metres of water per second the height of a flood equal to that of January last would be reduced by from 1·20 to 1·70 metres in the heart of Paris.

While the condition of the up-river suburbs would be considerably improved, the new canal would probably have a prejudicial effect on some localities lower down, and notably at Gennevilliers. Therefore, the Commission propose that the bed of the Seine should be deepened between Suresnes and Bougival, an undertaking involving the additional outlay of 1,200,000*l.* approximately. Hence, the total cost of the canal project and auxiliary works may be put at 8,000,000*l.*, so far as can be judged at present.

Taking these two projects in conjunction with the proposed widening of the narrow arm of the Seine to the right of the Ile de la Cité, provisionally estimated to cost 880,000*l.*, we have three items of a programme which, although necessitating an outlay of some 9 millions sterling, appears to promise a complete solution of the main problem.

The idea of a by-pass canal is by no means new, having been first proposed in 1651; in 1764 it formed the subject of a memoir read by M. Deparcieux at the Académie des Sciences, the line of the canal as then proposed proceeding from Gournay to the Seine at Saint-Denis, as represented in the plan. The length of the canal as now proposed will be 25 kilometres from Annet to le Bourget, this reach being controlled by regulating weirs; the remaining portion is 8 kilometres long with locks 150 metres long by 12 metres wide.

The Commission believe that the outlay is by no means disproportionate to the benefits offered, a view with which we fully agree. It is to be hoped that the French Government may be able to deal promptly with the very able report placed at their disposal by an assembly of so many eminent engineers particularly qualified for the difficult task performed within so short a period of time.

SEPTIC TANKS FOR ISOLATED HOUSES.

UNKNOWINGLY applied in the familiar cesspool for many generations, the septic method of sewage purification is more evident to-day in municipal than in private installations. The simple type of septic tank described in this article was devised by M. J. Sylvain Périssé, of Paris, an eminent French engineer who has made special study of the question concerned.

It is necessary to recognise the point that the septic tank, as designed for a private house, presents some features which are not found in municipal plant. For instance, the private tank should have a capacity of from ten to twenty times the maximum volume of liquid for treatment, and the period of eight days must be allowed for purification. Again, the private tank should be covered in, with the objects of augmenting the action of anaërobic microbes and of reducing the generation of gas.

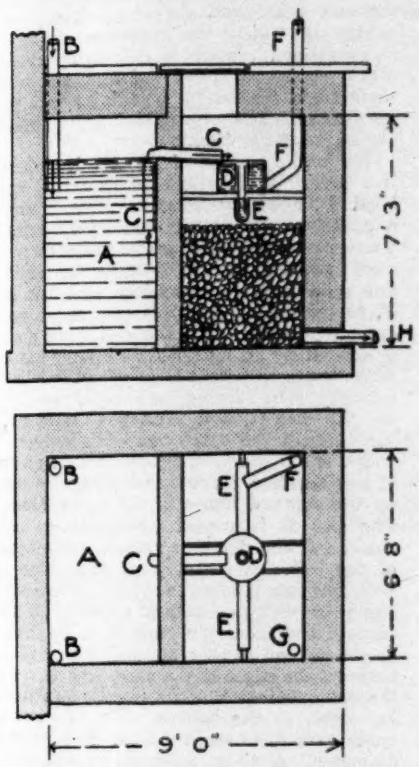
When greasy water from the kitchen is delivered into the tank the capacity of the septic compartment A (see drawing) should be at least fifteen times the daily volume of liquid, otherwise the desired transformation may be incomplete. Sewage should be so diluted that the proportion of water is not less than from 2 to 3 gallons per person, while double the quantity of water gives the best results. At the same time it is not desirable to discharge excessively large volumes of water into the compartment A, as the disturbance so caused may interfere with bacterial action.

The inlet pipes B are continued down for about a foot below the constant level of liquid in the tank, and the vertical branch of the outlet pipe C should start at about 30 in. below the same level.

The effluent from the septic compartment contains a large number of microbes, chiefly

anaërobic. Pathogenic organisms are not entirely destroyed, but their virulence is much diminished by proliferation and the action of harmless microbes, and it is stated that typhoid bacillæ are never present.

In the second compartment, where oxidation takes place, air should be freely admitted in order to permit aërobic microbes to destroy those of anaërobic nature; and to nitrify the ammoniacal products coming from the septic compartment. The pipe C discharges into the vessel D, which is provided with an automatic trap whence the liquid flows into the distributor E. By connecting a rain-water pipe F with the distributor the double advantage will be secured of assisting in the aeration of the liquid and of automatically scouring the interior of the distributing pipes.



Septic Tank for Isolated House.

In the second compartment, furnished with a vent G and an outlet pipe H, is a bed of porous material, such as coke, which should be alternately dry and wet so as to facilitate the intermittent penetration of air. For a household of from eight to ten persons the surface of the oxidation bed should not be less than 40 in. square and the volume of material about 1½ cubic yards, these dimensions varying according to the porosity of the material employed.

The drawings here reproduced are from an article by M. Périssé in the *Génie Civil*, and represent an installation recommended for a household of from fifteen to twenty persons, the septic compartment having the capacity of 4,400 litres, and the oxidation compartment having the surface area of 2·5 square metres.

THE PURPORT OF DEFLECTION IN REINFORCED CONCRETE TESTS.

ARCHITECTS and engineers usually state in specifications for floors, decking, and arches of reinforced concrete that the maximum deflection, under a test load of from 50 per cent. to 100 per cent. greater than the normal load for which the construction has been calculated, shall not exceed a certain limit, generally expressed as a fractional part of the span.

Tests conducted in compliance with stipulations of this nature almost invariably prove that the actual deflection registered is very much smaller than the permitted amount. For instance, it is not at all unusual to find that in a floor which the designer would cheerfully pass with the test-load deflection of $\frac{1}{600}$ the span is capable of supporting the specified superload with something like one-sixth or one-eighth of that proportionate deformation.

When results of so favourable a nature occur the representatives of special systems of reinforced concrete are induced to crow somewhat loudly and to suggest that the smallness of the deflection measured directly indicates the proportion of surplus resistance possessed by the construction.

While not for a moment disputing the satisfactory purport of proportionately little deflection, and conversely the unsatisfactory purport of proportionately great deflection, we are bound to say that deflection in itself does not constitute a trustworthy basis for judging the actual resistance of any structure unless all the factors involved are duly taken into account.

Some of the essential factors can be obtained approximately without much trouble, and others cannot be ascertained even approximately in practical work. Consequently the precise significance of deflection tests as conducted upon completed structures is invariably obscure, and particularly so in cases where the loading consists of materials applied so as to permit the development of arching action which relieves the spans under test from a considerable proportion of the load apparently imposed.

Some useful light is thrown upon the purport of deflection by a series of tests conducted by Professor Bach, of Stuttgart, who submitted several reinforced concrete beams of equal dimensions to successive loads of 6, 12, and 24 tons, and carefully measured the resulting deflection.

He found that for the loads in question the deformations were as follows —

Load.	*Deflection.*
6 tons.	0·29 to 0·31 millimetre.
12 „	0·71 to 0·77 „
24 „	2·32 to 2·35 „

Yet, while the deflection for each load was approximately uniform for all the beams, the ultimate resistance of the same members, as ascertained by subsequent tests to destruction, varied between 24 and 46 tons, equal to the maximum difference of about 100 per cent. Accepting deflection as a true measure of ultimate strength, but merely for the sake of argument, two extreme cases might be deduced from the foregoing results.

1. That a beam designed with 4 as the factor of safety may possess the factor of 8 as an actual value.

2. That a beam designed with 4 as the factor of safety may have only 2 as the value of that factor.

In reality, however, a satisfactorily small proportionate deflection proves nothing except that the structure tested is capable of carrying more than the load for which it was designed without injury. It gives no indication as to the adequacy of the design, the quality of the workmanship, and the degree of security afforded.

Although admitting that deflection tests are both useful and necessary for the satisfaction of responsible designers, it is well that their limitations should be clearly recognised.

Dam Across the River Ebro.

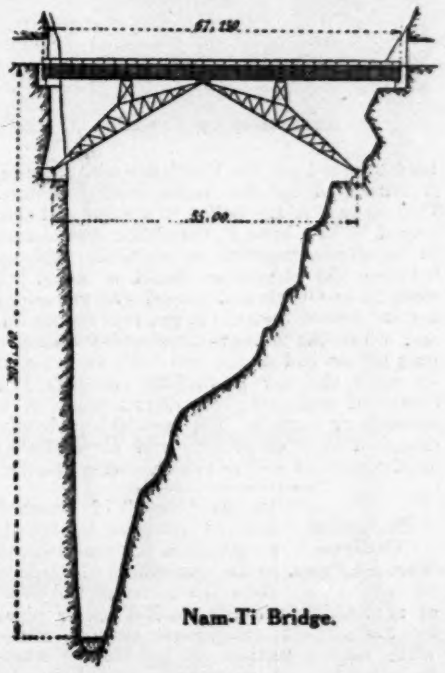
ACCORDING to the annual report of Mr. Roberts, British Consul-General for Barcelona and district, a British company, having purchased from the Spanish holders a concession for the construction of dams across the River Ebro at certain points, are about to build a dam on the Ebro at a point some twenty miles from a place known as Mora del Ebro, at a cost of about 200,000*l*. The water thus impounded will, it is calculated, give from 30,000 to 50,000 horse-power, and enable the company to supply all the towns and villages for some 150 miles around with electric power. The point where the company will commence working is about 100 miles from Barcelona.

Proposed New Railway Bridge.

THE Great Central Railway Company have applied to the Board of Trade for consent to the construction of a new railway bridge over the River Trent at Keadby, near Doncaster, just north of (or below), and in substitution for the existing bridge. One of the inspectors of the Board of Trade will hold an inquiry on the subject at Doncaster on the 18th inst.

Remarkable Bridge in China.

IN consequence of the climate, transportation difficulties, and the incompetence of local labour the engineers of the Zunnan Railway decided to abandon the idea of building stone viaducts and to employ steel bridges sent out from Paris in sections. One of these structures is described in the present article. It crosses the Nam-Ti River at the height of 335 ft. above water level and at a point where the chasm is about 223 ft. wide. As the railway pierces the almost perpendicular walls of the gorge by means of two curved tunnels it would have been exceedingly troublesome to construct an ordinary girder bridge. Moreover, it was very desirable, for the purpose of avoiding hindrance to general progress, to commence this structure before the railway had reached the river, consequently, in the absence of wagon roads, most of the material had to be conveyed by mules in bundles not exceeding 175 lb. in weight or 8 ft. in length. These conditions were mainly responsible for the peculiar design diagrammatically illustrated. The triangular supporting trusses are supported at the lower end on a stone pier by means of a steel ball and socket joint, and are connected at the upper end by hinged joints with 7·6 in. diameter forged pins. These supporting trusses were sent out from France in small parts and assembled on the site. The girder span



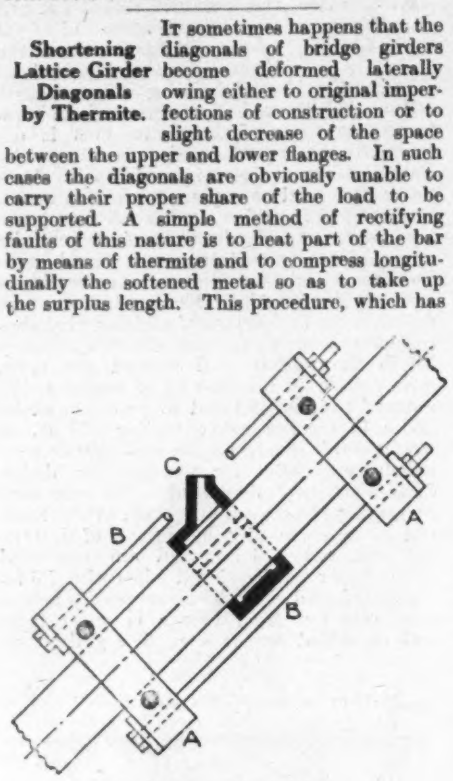
Nam-Ti Bridge.

carrying the permanent way was prepared in larger sections, transported from the sea by railway, and assembled after the line had been completed up to the Nam-Ti River. The supporting trusses were partly built up in the two tunnels and slung into position by means of a steel cable operated by windlasses on either side of the gorge, and the trusses were completed in a vertical position, being tied back to the cliff until everything was ready for lowering the upper ends to meet in mid air. This operation was performed by the aid of two chains, each 900 ft. long, carried through mountain passes for 12 miles or more by natives walking 5 ft. apart. Each chain was passed through a pulley block at the upper end of one truss and over a similar block secured to the cliff above, the other end of the chain being attached to a windlass. When all was ready the two chains were gradually paid out, and the trusses descended like the two halves of a drawbridge. On completion of the central joint the two intermediate towers for supporting the main girder were fixed in position. The latter, designed to consist

of two end spans, 51·6 ft. and 71·7 ft. long respectively, and two intermediate spans, each 48·2 ft. long, was built in the tunnel as a continuous girder and moved forward, as fast as assembled, by the aid of rollers on the three intermediate supports. Then, after the opposite end had been placed on the abutment provided, the temporary connexions were removed so as to divide the truss into four separate spans. This bridge which was completely erected in about eight months, is an apt illustration of the ingenuity displayed by French engineers in constructive work.

Shortening Lattice Girder Diagonals by Thermite.

It sometimes happens that the diagonals of bridge girders become deformed laterally owing either to original imperfections of construction or to slight decrease of the space between the upper and lower flanges. In such cases the diagonals are obviously unable to carry their proper share of the load to be supported. A simple method of rectifying faults of this nature is to heat part of the bar by means of thermite and to compress longitudinally the softened metal so as to take up the surplus length. This procedure, which has



Shortening by Thermite.

been adopted on the Continent with success, is illustrated by the accompanying section. Two clamps A are bolted to the bar and connected by two bolts B, permitting the clamps to be drawn together as required. Midway between the clamps is placed a mould C, made in two parts and jointed with refractory earth. Melted thermite is run into the mould, and when the metal reaches white heat the nuts at one end of the two bolts are screwed up until the bar is perfectly straight and shortened sufficiently to do its duty in a satisfactory manner. The method here briefly described may often be found of service in architectural as well as in engineering practice.

Depositing Concrete Through Pipes.

In our "Note" of March 5 last we referred to experiments made last year relative to the conveyance of concrete from the mixer to the point of application through small-diameter pipes by the aid of compressed air. A somewhat similar method of handling concrete is already in practical operation by the Engstrum Company, of Los Angeles, U.S.A. The arrangement of plant adopted by this firm is to install the mixing plant at ground level, the concrete being discharged into elevator buckets delivering the material into a hopper on a tower of adequate height above the work to be executed. To the lower end of the hopper one or more pipes are attached, through which the concrete flows by gravitation to the required place.

The pipes are of 8 in. diameter, made of sheet metal, in lengths which can be readily connected to form a delivery conduit of any required length up to about 100 ft. As it is necessary that the pipes should be capable of angular motion to permit the concrete to be delivered at various points within reasonable limits, two swivel joints are provided, one at the hopper and the other near the end of the pipe. The hopper joint is usually formed by making the first length of the pipe with a closed end and an opening on the top to receive a vertical pipe projecting from the bottom of the hopper. The other joint is made by attaching a bend at the distance of about 15 ft. from the extremity of the pipe, this bend fitting into the hopper end of another pipe, which can be rotated through a complete circle.

As the pipes are of thin-gauge metal, they require support at frequent intervals, so as to obviate excessive bending under the weight of the semi-fluid concrete. In some cases the pipes receive intermediate support from ropes passing over blocks on the hoist tower, and in others where the pipes are of considerable length it is necessary to employ booms swung from the tower, and from them to hang wires for suspending the pipes.

In the erection of the Timkin Building, San Diego, the supporting boom consisted of a light box girder with latticed sides, the pipe being carried inside, but, as the girder was not capable of bearing the weight of concrete, an auxiliary boom was swung from the tower for the attachment of suspension wires.

For the construction of the Christian Science Temple, Pasadena, the pipe was suspended from a trussed boom capable of carrying the weight of the pipe and concrete when supported at two points only.

Where the discharge pipe is of greater length than can be supported by the use of a boom, intermediate timber towers are constructed, and the pipe is carried between these by timber trusses. As the towers can be mounted on wheels, the direction of the delivery pipe can be changed without inconvenience.

An extensive concrete distributing plant laid down in connexion with the State Normal School, San José, provided for the delivery of concrete over the total length of 500 ft. Three concrete plants were installed, each comprising a mixer, an elevating tower, two delivery pipes with two branches, and several intermediate towers for supporting the pipe lines. By these means the whole area of the building was efficiently commanded.

According to practical records, the discharge through a pipe of 8 in. diameter is about 30 cubic yds. per hour for concrete mixed with sufficient water to enable it to run freely.

The system described obviates the necessity for tramlines, waggons, and wheelbarrows, and, after allowing for the cost of the necessary auxiliaries, is said to involve less outlay than the customary outfit, while experience derived from several contracts shows that the cost of mixing and distributing concrete can be reduced by from 6d. to 1s. per cubic yard, according to circumstances. The method clearly deserves consideration by contractors having occasion to deal with concrete on a large scale.

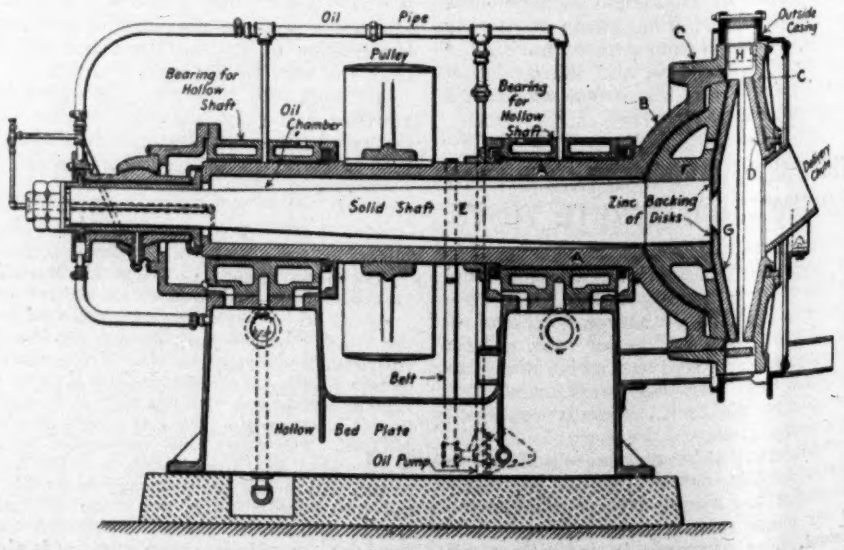
The Effective Resistance of Steel Channel Bars.

In the *Proceedings* of the German Society of Engineers Professor Bach gives an account of tests conducted on rolled-steel channel bars with the object of ascertaining whether their resistance is really that indicated by the theoretical formula usually applied in practical computations. The results quoted show clearly that this is not the case, and that the effective resistance of such sections is considerably smaller than the theoretical value. The reason assigned for the difference is a false conception of the stress distribution in the wings of these unsymmetrical bars. It is assumed in theory that the stress diagram takes the form of a right-angled triangle with a curved hypotenuse. That the assumption does not strictly hold good is shown by the fact that the deformation of the bars tested was characterised by lateral distortion, accompanied by axial torsion. The author adds, however, that when channel bars are assembled with other sections or riveted back to back their resistance is greatly increased.

Disc Stone-Crushing Machine.

A form of stone-crusher recently introduced in the United States embodies the principle of employing two revolving discs set at a small distance apart and shaped so as to form a cavity in which the operation of crushing is performed. Stone is delivered through a shoot at the centre of one disc, and broken material is ejected by centrifugal force when crushed sufficiently to enable it to pass between the edges of the discs.

We give a section of the machine, where A is a hollow shaft with a hemispherical socket head B, upon the flange of which is screwed a cast-steel cap C, having a feed opening at the centre, and inside it is attached a manganese steel crushing disc D. Inside the shaft A is a solid shaft E, terminated by a ball head F, to the face of which is secured the second crushing disc G. The other end of the shaft E is carried by an independent bearing provided with screws to permit the shaft to be adjusted laterally, thus varying the angle of the disc D to the disc G, and causing a corresponding variation of the space between the discs, the width of the space being adjusted for material of any required gauge by revolving the cap C on the screwed flange of the socket head B. The disc D is rotated directly by the hollow shaft, and the disc G is rotated by the friction of the ball and socket joint when stone has been introduced into the cavity. Fragments of stone thrown by centrifugal action to the wider part of the space are crushed as the interval decreases, and as soon as small enough to pass between the edges of the discs they are ejected through openings H into a circular hood having an outlet at the bottom. The machines are made with discs ranging from 13 in. to 48 in. diameter. A 13-in. machine, running at 600 revolutions per minute, takes 2-in. stones and crushes to ½ in. or smaller gauge, its output when delivering ¼-in. material being about 7 tons per hour. A 24-in. machine, running at 400 revolutions per minute, takes 4-in. stones and reduces to ¼ in. gauge, its output for ½ in. gauge being about 20 tons per hour. A 48-in. machine, running at 250 revolutions per minute, takes 7-in. stone and reduces to ½ in. gauge, its output for 1 in. gauge being from 50 to 90 tons per hour. It is stated that crushing is performed by direct pressure and without grinding action, this being an important point for concrete mixing and other operations where cleanly-broken stone free from dust is a desideratum.



Section of Stone-Crusher.

BOLBEC HALL, NEWCASTLE-UPON-TYNE.

THIS building is erected on the site of a former Manor House of Walter de Bolbec, and is the property of the Literary and Philosophical Society. It is a steel-framed building, it being an instruction to the architect that the building be designed so as to admit of part, or the whole of the partition walls to be taken down at any time, without disturbing the structure. The site being a restricted one, the exterior design is limited to one frontage, with a small return piece.

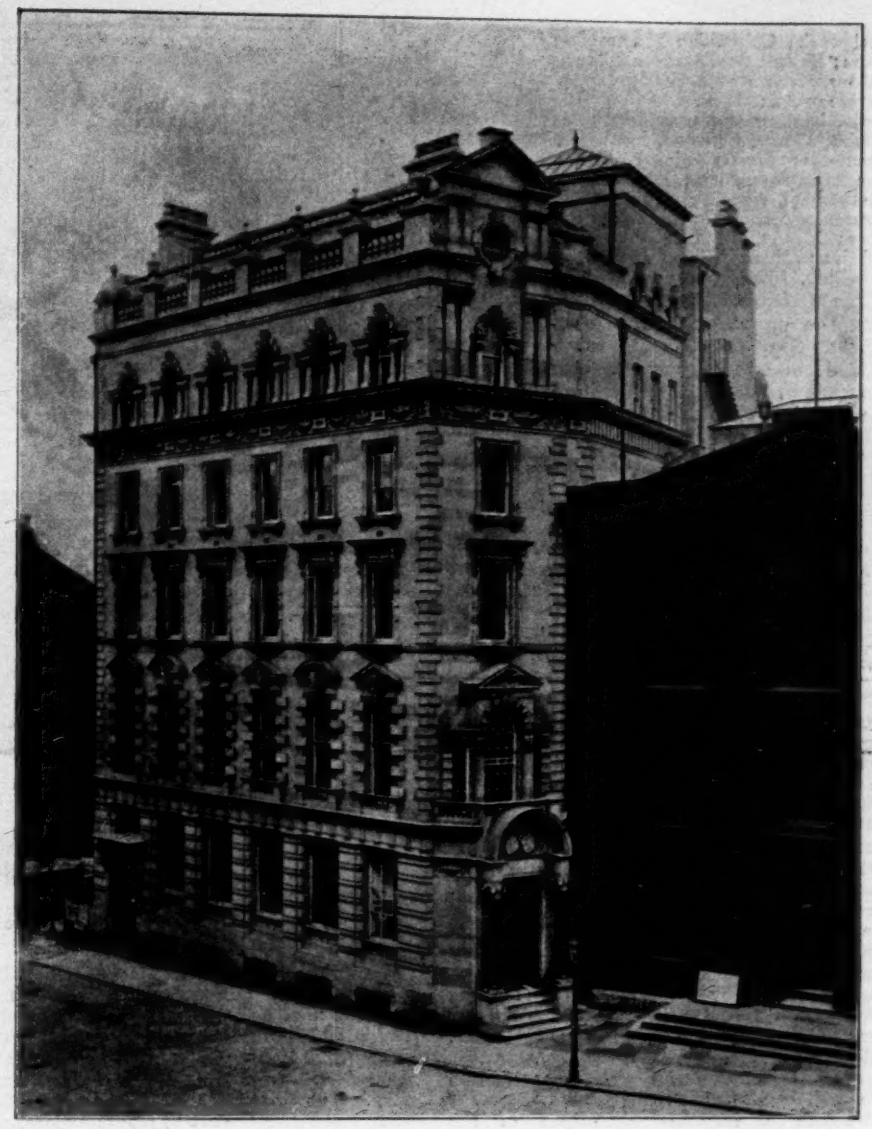
The whole of the floors have been divided off for commercial use, for offices, with the exception of a portion retained as part of the Library of the Literary and Philosophical Society.

The facing is of Kenton stone. The two columns to the entrance doorway are in red granite, with bronze drums, having the Bolbec Lion in relief. The heraldic device in the Tympanum shows the same arms, combined with those of "Neville."

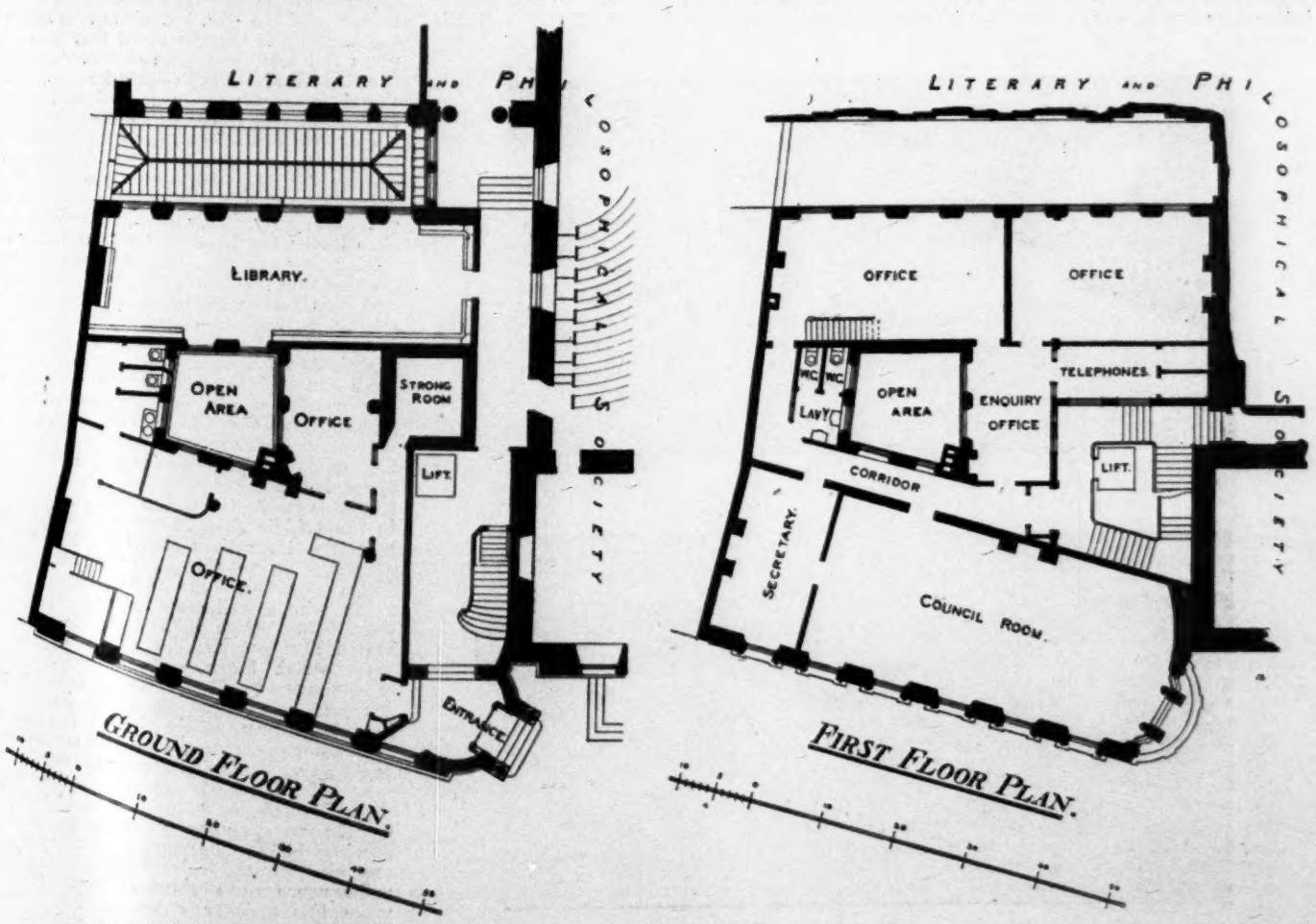
The staircase is in Yorkshire stone throughout, the walls panelled in fine marbles, the balustrade of wrought-iron and mahogany. The lift, situated in the ample well of the stairs, is an electric one, and serves seven floors; nothing appears in the stairway except the cage of the lift and two bright steel guide rods, the counterbalance weight being conducted over the roof to the central area. The staircase is lighted by a glass dome. The Council Chamber on the first floor is panelled in mahogany, and the ceiling treated in Georgian ornament.

The architect had the pleasure, not always accorded to architects, of designing the furniture as well as the building. The building is nearly entirely occupied, as the head-quarter offices of the Federated Employers—

The contractors carrying out the work were—Messrs. Middlemiss Bros., mason and joiners' work; Mr. Charles Nicholson, slaters' work; Mr. Robert Herron, plumbers' work; Mr. John Chapman, plasterers' work; Mr. George G. Laidler, painter and glaziers' work; Messrs. Dorman, Long, & Co., of Middlesbrough,



Bolbec Hall, Newcastle-upon-Tyne.



Bolbec Hall, Newcastle-upon-Tyne.

steel work; Columbian Fireproofing Company, floors; Messrs. Geo. Jackson & Sons, ornamental plaster work; Messrs. Emley & Sons, Gateshead, marble work; Messrs. Emley & Sons, Newcastle, heating and ventilating; Messrs. Wenham & Waters, Croydon, iron dome, roof, and casements; Messrs. Singer, Frome, wrought-iron balustrades, etc.; Messrs. H. H. Martyn, Cheltenham, stone carving; Messrs. Waygood, London, electric lift; La Brea Asphalte Company; Messrs. J. H. Holmes & Co., electric lighting; Messrs. Sopwith & Co., mahogany panelling, furniture, and fittings, etc.

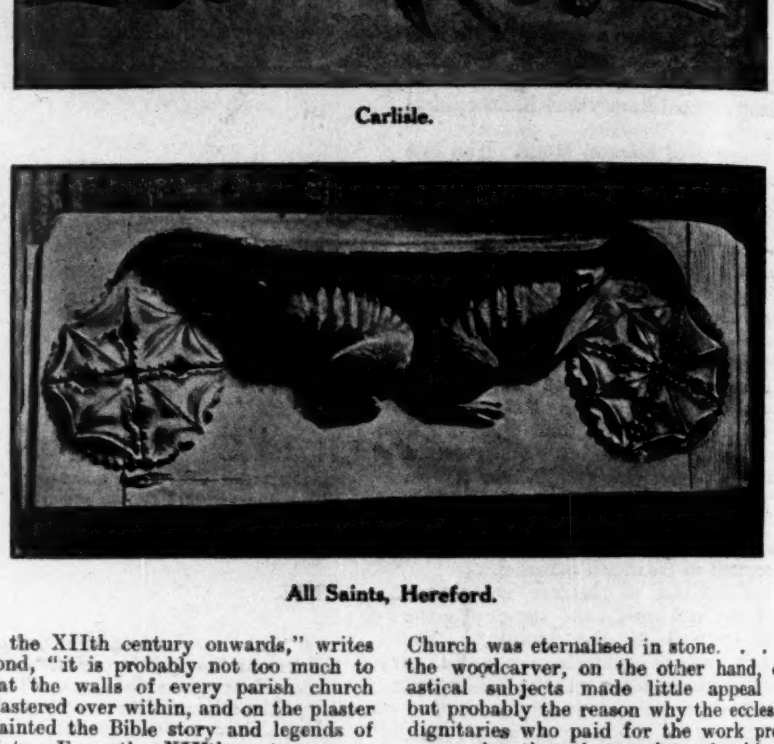
The whole of the contractors held contracts with the proprietors, there being no subletting. The total cost was just under 20,000*l.*, and the extras nil. The whole of the work was designed and carried out under the superintendence of Mr. Frank W. Rich, F.R.I.B.A., Newcastle-upon-Tyne.

BOOKS.

Woodcarvings in English Churches. I.—Misericords. By FRANCIS BOND, M.A., Hon. A.R.B.A. Illustrated by 241 photographs and drawings. (Henry Frowde, Oxford University Press, London, New York, Toronto, and Melbourne. 1910. 7*s.* 6*d.*)

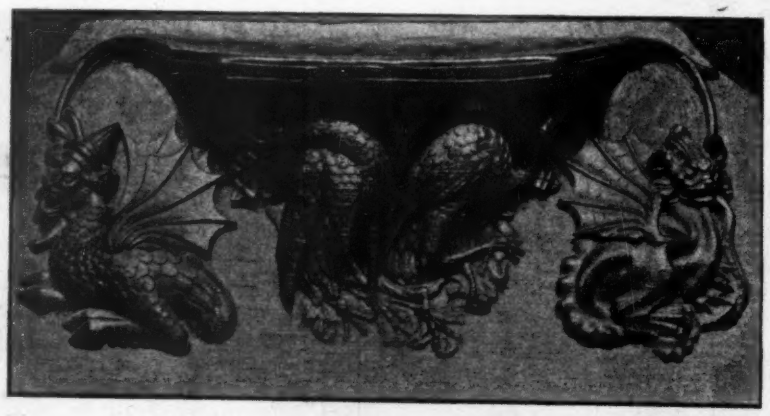
OUR English carved misericords are an apt illustration of that grotesqueness which Ruskin placed among the characteristic or moral elements of Gothic art. It may well be that the mediæval craftsman selected the misericord as a vehicle for satirising the foibles of his age—turned it, in fact, into a sort of ecclesiastical *Punch*, as being in itself but a concession to the feebleness of the human frame, and occupying besides, as Mr. Bond hints, anything but a dignified position. Here the mediæval fancy riots in well-nigh untrammelled freedom: the secular clergy lampoon the monks and friars, moral lessons are inculcated by representations of "the happy home and its contrast," while strange beasts culled from the pages of the bestiaries, subjects from classical mythology, and the routine of everyday life, all came as fish to the craftsman's net. In fine, our misericords constitute a veritable microcosm of the Middle Ages. In a field so wide and unrestricted it may at first sight seem strange that scriptural subjects are in a great minority, and on this point we cannot do better than let the author speak for himself.

Carlisle.

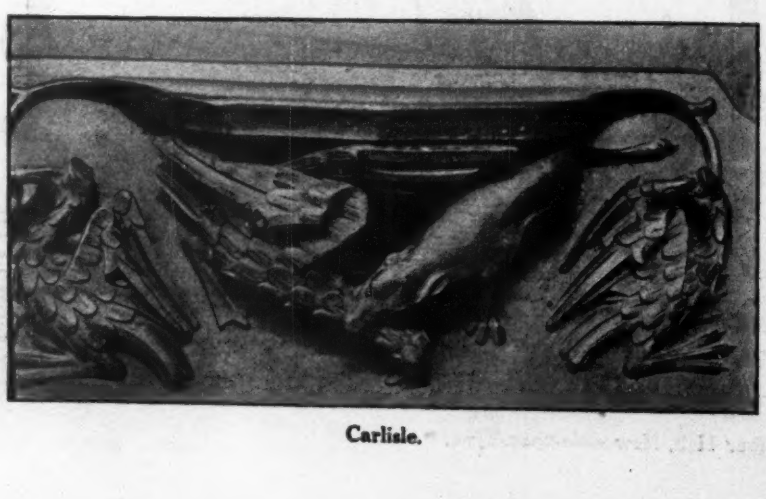


All Saints, Hereford.

"From the XIIth century onwards," writes Mr. Bond, "it is probably not too much to say that the walls of every parish church were plastered over within, and on the plaster were painted the Bible story and legends of the saints. From the XIVth century, commencing at Gloucester *c.* 1350, new mastery was gained over the art of staining glass, and in all the larger churches, and in hundreds of minor churches, every window repeated the story of the Old and New Testament and the Christian Church. In the greater churches, too, the history of God and His Church was eternalised in stone. . . . To the woodcarver, on the other hand, ecclesiastical subjects made little appeal . . . but probably the reason why the ecclesiastical dignitaries who paid for the work preferred as a rule other than scriptural subjects was that they did not wish a delineation of sacred things to be placed where it would normally be in contact with the least honourable portion of the human person." It is frequently possible to date a set of misericords by the costume of the figures, the character of the foliage, and the like, but where such criteria are wanting it may be noted that the seat-plans fall into three main groups. Those of the XIIIth and XIVth centuries are simple, the sides usually concave, the front straight or concave, rarely convex; during the XVth and XVIth centuries down to the Dissolution they became more complicated, having four, five, or six sides, and normally a projecting point in front. Difference of mouldings does not necessarily imply a difference of date. At Chester the hand of the same carver is clearly traceable on many of the seats from the uniform excellence of their execution, and this carver employed his own set of mouldings, while another, an inferior craftsman, employed a different set. In England a misericord of normal design had a centre-piece flanked by supporters; these supporters are usually absent in foreign examples. Turning to the illustrations, which are uniformly excellent, the misericord at Carlisle (page 37), representing a fox seizing a goose, is a work of exceptional ability, which makes us realise the wealth of talent existing in the Middle Ages among what we should now term the artisan class. At All Saints', Hereford (page 65), are some wonderful pieces of nature-study in the rendering of "rats, mice, weevil, woodlice, and other small deer." The action of the two figures represented at Gloucester (page 102), playing a game which bears considerable points of resemblance to Rugby football, is very spirited, but perhaps no design illustrated here shows finer qualities than the two herons at Chester (page 107), a genuine masterpiece in its way. The volume forms the third of a series of Church Art Handbooks, the two first of which, on "Screens" and "Fonts," by the same author, we have noticed in previous issues. The present work deserves unstinted praise, and augurs well for the maintenance of a standard which should make this series a *corpus* of information invaluable to the ecclesiologist and serious student of mediæval art in England.



Chester.



Carlisle.

On the Evolution of Hospital Design. A paper read at the Hospital Officers' Association, March 18, 1910. By KEITH D. YOUNG, F.R.I.B.A. (London: The Scientific Press, Ltd. 1910. 1s. net.)

THIS is an all too short but very comprehensive review of the history of the hospital idea and its embodiments from about 3,500 B.C. in Egypt to the "Wardunit" system in the Western Infirmary, Glasgow. It contains a considerable number of plans, and an interesting view of the interior of the Hôtel Dieu, Tonerre. As the author remarks at the end of his paper, hospital building is a work that cannot stand still, and it behoves those concerned to keep abreast of the advance of knowledge; to this end it cannot, he thinks, be altogether amiss to look back now and again and take stock of the past, so that haply we may find it throw light on the future.

A Theory of Drawing. Suggested on reviewing an article in the *Slade*, by Mr. J. R. Fothergill, on "The Principles of Teaching Drawing at the Slade School." By Sir MONTAGU POLLOCK, Bart. (London: G. Bell & Sons, Ltd. 1910. 6d. net.)

THE author of this pamphlet is well known by his book on Reflection of Light and Colour in Water, which perspective artists especially would do well to read. In this essay, or rather argument, the same powers of close and pertinacious reasoning is betrayed. It is a sustained discussion of the metaphysic of draughtsmanship, and leaves one with the impression as of one protagonist alone to whom the rostrum is ceded in some impossible *Nouvelles Athènes*.

FOREIGN AND COLONIAL.

Building and Timber Trades in Germany.

In his report to the Foreign Office, just issued, on the trade and commerce of the consular district of Dusseldorf (Westphalia and the Rhenish Provinces), Mr. F. P. Koenig, British Consul-General, writes, *inter alia*:—"The burdens which commerce and industry have to bear in Germany have, if anything, increased year by year. New and more stringent laws have been passed for the regulation of the building and other trades; the building trade particularly has been burdened with stricter laws. . . . Saw mills did not recover very much from the depression existing during the year 1908; in 1909 the building trade did not revive to any appreciable extent; still, on the whole, the year 1909 proved somewhat more satisfactory than 1908. The North-West German Syndicate and the Rhenish-Westphalian Syndicate were formed, and have so far proved useful. In Sweden the general strikes in the timber yards drove the price of timber up, and both Swedish and Russian timber rose in price. American oak, pitch-pine, Caroline pine, and cotton wood all rose in price. America is using more timber in the home market, as trade is reviving there, and building is increasing. South German, Austro-Hungarian, and Roumanian timber boards are still a drug in the market, owing to large stocks on hand; this over-production and large supply will find its level as the building trade improves. . . . The year 1909 showed a great improvement on the preceding one, so far as the building trade is concerned. During 1907-8 that trade was very quiet. This resulted in a scarcity of houses. Dwelling-houses have been extensively built during the last year, but industrial works have held back. The tax on real estate changing hands has been raised this last year. There is at present a tax of 2 per cent., which goes to the municipality, and a further tax of 2 per cent., which is levied by the Government on all purchases of real estates; this increase has had a bad effect on the market. Besides these taxes, every municipality in Germany has the power of imposing a tax on unearned increment. Some towns have adopted the tax on unearned increment, but others have not introduced it. . . . It is expected that the present prosperity in the building trade will continue. Needless to say, all industries supplying the building trade with material are sharing in the present prosperity. . . . Timber merchants complain of want of orders. In certain towns of this district, like Dusseldorf, building is doing well, but the big firms in other parts of this district have not begun erecting new buildings or extending their works. Pitch-pine importers have formed a syndicate, and are reaping the benefits of syndication. Other American timber is very expensive. Scandinavian and Russian timber exporters are asking higher prices for red and white wood, and, taken all round, timber is likely to rise in price, owing to the increased demand and limited supply. American oak and ash are in strong demand, and oak is being used more than formerly. American walnut is rising in price owing to its popularity in the manufacture of furniture. Mahogany is in great demand, too. Teak is being neglected, whereas ebony, palisander, lemon, and other valuable tropical woods are being preferred; the latter, particularly palisander, are being increasingly used for houses in wall panelling and for doors."

New Buildings in Brazil.

The British Acting Consul-General at Rio de Janeiro reports, says the *Board of Trade Journal*, that a contract has been made by the Federal Government with a Brazilian firm for the construction of a post-office building at Porto Alegre, at a cost of over 724,000 milreis (about 48,300*l*.). The name of the contractor may be obtained by British firms on application to the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, London, E.C. H.M. Consul at Pernambuco (Mr. C. L. M. Pearson) reports that Mr. Julius von Sohsten, of that town, and Messrs. Mendes Lima & Co. have been granted the right for a period of thirty years of fishing at the port and in the neighbourhood of Maceió. The concessionaires undertake to establish a suitable curing factory and cold storage for the preservation of the produce. Any machinery, steam trawlers, building material, etc., imported for use in fishing or curing and refrigerating fish will be admitted free of duty.

COMPETITION NEWS.

New Premises, Bournemouth.

It will be noticed that in the advertisement of this competition no assessor is named. On investigation we are informed that it is probable that Mr. J. E. Beale, the proprietor of the "Emporium," who institutes the competition, will himself decide which is the best design sent in. We trust that this is no more than a possibility which later consideration will remove—at any rate, it is to be hoped so in the interests of Mr. Beale and for the support of his competition.

Romford Garden Suburb.

This competition is, we understand, proving exceptionally attractive to the architectural profession, affording, as it does, an opportunity for the architect to erect, at a comparatively small outlay, a house according to his own architectural ideals, free from any interference or instructions on the part of a lay client, and the fact that houses built under these conditions represent the unfettered individuality of their authors makes the Exhibition of interest to the architectural profession quite as much as to the general public. To the builder accustomed occasionally to build on speculation, a chance of a 100*l*. prize, and the certainty that his house will be carefully inspected by some thousands of possible purchasers, offer obvious attractions. The object for which this Exhibition has been instituted—the improvement of minor suburban architecture—is one of great importance to London, and the success of the Exhibition should lead to the increased employment of architects in the designing of a class of houses where too often a minimum of professional assistance is at present utilised.

Street Improvement at Swansea.

The Property and General Purposes Committee of Swansea Town Council considered at their last meeting matters in connexion with the obtaining of competitive designs for elevation of the Castle-street improvement. The Sub-Committee reported that the President of the Royal Institute of British Architects had nominated for the assessorship Mr. S. S. Reay, of Bath, and that Mr. Reay had attended a meeting of the Sub-Committee, when he was requested to furnish a report in writing. Mr. Reay's report was read, from which it appeared that he was "of the opinion that no satisfactory result can be expected from a competition under the suggested conditions, and that the objects of the Council can be best obtained by offering the prize of 50*l*. to the author of the design placed second, and that the architect of the best design should be remunerated at the usual rate for the further work which will be required in preparing the necessary working drawings. . . . The usual remuneration for such work would be 2½ per cent. upon the estimated cost of the building, which should not exceed 10,000*l*." Mr. Reay further stated:—"There is one point in connexion with the plan of the street that should be reconsidered. I refer to the awkward break inwards at one end, caused by a too rigid adherence to the width determined upon. Such a break if followed will quite destroy the architectural effect of the whole, which can easily be avoided." The Committee decided that the resolution of the Council fixing the width of the street at 60 ft. should be reaffirmed; also that the proposal to pay a premium of 50*l*. for the selected design be adhered to.

Telegraph Monument, Berne.

We are informed that the international competition which has been held for the erection of a monument commemorating the initial signatories to the International Telegraph Convention at Berne has resulted in the jury of assessors refusing to adopt any of the designs submitted. We remember that the site and general aspect of the conditions did not seem propitious—at any rate, from the point of view of English architects. Another competition is to be held, which we understand will close on June 15, 1911, and which we trust will be made more congenial to the customs of contemporary English practice.

LONDON COUNCILS.

Bermondsey.—The Borough Council has passed plans as follows:—Alterations, factory, Grange-road, Messrs. Ashby & Horner, builders, 8, Aldgate, E.; building for British Oil and Cake Mills, Ltd., 247, Rotherhithe street, Yorkshire Hennebique Contracting Company, Ltd., builders, Viaduct Works, Leeds; alterations, etc., "Victoria" beerhouse, 68-70, Pages-walk, Mr. Wm. Harper, builder, 174, Bow Common-lane, E.; flats, Lafone and Queen Elizabeth streets, Mr. W. Nash, Childers-street, Deptford, S.E.; alterations, "Royal William" beerhouse, Abbey-street, for Messrs. Truman, Hanbury, Buxton, & Co., Ltd.

Deptford.—A portion of Mantle-road is to be paved with second-hand granite setts at an estimated cost of 186*l*. The tender of John Mowlem & Co., Ltd., at 4,687*l*. 10s. 3d., for woodpaving portions of Evelyn-street has been accepted. Tenders are to be invited for the builders' work of altering the first-class swimming-baths at Laurie-grove and for flooring the same, so as to render it fit for a room to be used for music and dancing and public purposes. The total estimated cost of the work, including the provision of seats, is put at 980*l*.

Hammersmith.—The Council are to raise the height of the river wall opposite the southern end of Weltje-road. Plans have been passed for Mr. J. Knight, for the erection of four warehouses in Scrubbs-lane.

St. Pancras.—Messrs. Hart & Waterhouse, architects, 1, Verulam-buildings, Gray's Inn, W.C., wrote to the Council asking that the public sewer running under Nos. 362-4, Gray's Inn-road, might be diverted, and that they be allowed to build over the sewer. Permission was given for the work to be carried out under protective conditions: the cost of the diversion to be defrayed by the applicants.

Southwark.—The London County Council are to be asked to undertake the widening of Walworth-road at the junction of New Kent-road, as a Metropolitan improvement. The Ecclesiastical Commissioners have offered to accept 1,500*l*. for the land required. Plans have been passed as follows:—Mr. C. H. Mead, 64, Berner's-street, W., erection of warehouse upon site of Nos. 90-2-4-6, Union-street; Mr. C. B. Durston, Briar Cottage, Stanley-road, Woodford, building in Friar-street, to abut upon Green-street.

Stoke Newington.—The tender of Messrs. Wm. Griffiths & Co., Ltd., has been accepted for renewing wood-paving in Church-street.

Tottenham.—The Urban District Council has passed the following plans:—House, shop, and warehouse, 376A, High-road, for Mr. H. A. Knight; bakery and factory, rear of 79-91,

Braemar-road, for Mr. E. A. Chapman; completion of St. Ignatius Church, High-road, for Mr. J. Beart Foss; twenty-two houses, Bailey's-lane and Barry-avenue, for Messrs. E. Evans & Sons, 253, Lavender-hill, S.W.; iron mission hall, St. Francis de Sales, for the Rev. J. F. Subra; picture palace, 678, High-road, for Mr. B. J. Cannes, secretary, Estate, Land, and Houses, Ltd.; alterations, Glendale Hall, St. Ann's-road, for Mr. T. C. Dorling; alterations, Rose and Crown public-house, 336, High-road, for Messrs. Hoare & Co.; three houses, Moundfield and Castlewood roads, for Mr. P. Roche; twelve houses, Overbury-road, Tewkesbury Estate, for Mr. J. Burchell, care of Mr. Ernest Girling, 31-2, King William-street, E.C.; factory, Ashley-road, for Messrs. Sussman.

Twickenham.—The Education Committee has accepted the tender of Messrs. J. & M. Patrick, at 5,226*l.*, for the erection of the infants' department of the Orleans school. Plans have been approved for Mr. R. Skinner for four houses at River View-gardens.

Walthamstow.—Additional plant is to be installed at the generating station at an estimated cost of 9,500*l.* Upon the approval of the Essex County Council being obtained, the District Council's Engineer is to carry out, at an estimated cost of 100*l.*, alterations to the baths, to enable a cinematograph licence to be obtained for the building. Messrs. Geo. Sands & Son, Ltd., are to supply and erect, at 170*l.*, the steelwork for an extension of the car-shed; the Surveyor is to carry out the builder's work. The following plans have been passed:—Mr. H. H. Iles, fifteen houses, Aveling Park-road; Mr. A. Attwell, addition, factory, St. Andrew's-road; Mr. A. Burr, addition, club, Buxton-road; Mr. J. Dunn, six shops and thirty-three houses, Chingford and Brettenham roads; Mr. J. W. Abraham, nine houses, Gamuel-road.

Wandsworth.—The Highways Committee has under consideration a letter from the Improvements Committee of the L.C.C., stating that, subject to the Local Authority contributing one-third of the cost, they will widen a portion of Wimbledon Park-road, Southfield, to 50 ft. The estimated expense is 1,550*l.* Tenders are to be invited for paving two new streets in Springfield, and one in Tooting. The tender of Messrs. J. F. Bailey & Weller has been provisionally accepted, at 651*l.*, for paving the footpaths in part of Okeburn-road, Tooting. The following plans have been passed:—Four houses, Luttrell-avenue, Putney, for Mr. W. H. Earland; motor-garage, rear of 324, Balham High-road, and four houses with shops, Mitcham-lane, Streatham, for Mr. W. Bartholomew; six houses, Strathbrook-road, for Mr. F. C. Coad; twenty houses, Wimbledon Park-road, Southfield, for Messrs. Allen & Norris; four houses, Chillerton-road, Streatham, for Mr. C. Banks; seven houses, Edgeley-road, and Shamrock-street, Clapham North, for Mr. W. N. Gould; four houses, Putney Bridge-road, Southfield, for Mr. H. G. Leslie; electric pavilion, High-street, Clapham South, corner of Aristotle-road, for Mr. I. Davis; twelve houses, Park-hill, and eleven houses, Crescent-lane, Clapham South, for Mr. A. E. Peacock; additions, St. Gregory's Church, Garratt-lane, Springfield, for Messrs. J. Marsland & Sons; re-erection of 199-201, High-street, Wandsworth, for Mr. J. C. Radford.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

ABERCHAN. — Cookery and domestic arts centre (409*l.*); Mr. W. Branch, builder, Aberaychan.

Baguley.—Medical Superintendent's house at sanatorium (600*l.*); Mr. T. de Courcy Meade, Surveyor, Manchester City Council.

Beaumoris. — Proposed lifeboat station, Fryars Weir, for the Royal National Lifeboat Institution.

Belfast. — Memorial hospital (20,000*l.*); Governors, Royal Hospital, Belfast.

Blackwood. — Alterations, Old Blackwood School (648*l.*); Mr. J. Charles, builder, Newport.

Bradford (Lancs.).—School, Gibbon-street (6,884*l.*); Messrs. J. H. Reynolds and C. H. Wyatt, Joint Secretaries, Education Committee, Manchester City Council.

Bromley.—Addition, 156, High-street, for the Bromley and Crays Gas Company.

Broomfield (near Chelmsford). — Primitive Methodist church; the Trustees.

Burnham.—Lavatories, etc. (1,000*l.*), and pavilion (1,350*l.*); Mr. J. W. Pople, builder, Burnham.

Charlton. — Eight almshouses, Moorend Estate; Mr. Pizey, architect, Bristol.

Chryston. — School, Bridgend, for Cadder School Board.

Clevedon.—Proposed shelter (1,210*l.*); Mr. G. W. Knowles, Surveyor, Clevedon Urban District Council.

Croydon. — Rebuilding 62-4, High-street; Messrs. Rice & Son, builders, Stockwell-road, S.W. Extensive alterations, for Mr. J. Allders, 5, George-street; Messrs. Fred. Sage & Co., 58-62, Gray's Inn-road, W.C.

Crumpsall. — School, Clarendon-road, and alterations, existing school (3,826*l.*); Messrs. J. H. Reynolds and C. H. Wyatt, Joint Secretaries, Education Committee, Manchester City Council.

Driffield. — Adaptation of three houses, Middle-street North, into post-office; Messrs. Thorpe & Turner, architects, Goole.

Dundee.—Alterations and additions, drill-hall, for the Dundee Territorial Force Association.

East Denton.—Six houses; Surveyor, Newcastle Town Council

Esher. — Parish hall, Church-street; the Vicar.

Glasgow. — Concert hall (9,533*l.*); Messrs. Matthew Henderson, Ltd., builders, Glasgow.

Gwenddraeth. — School (250 places); Mr. J. W. Nicholas, Secretary, Education Committee, Carmarthen County Council, Carmarthen.

Horsham. — Proposed baths (2,000*l.*); Mr. R. Renwick, Surveyor, Horsham Urban District Council.

Huntingdon.—Four cottages, Brampton and King's Ripton; Messrs. F. B. Thackeray & Co., Huntingdon.

Keighley. — Enlargement of nurses' home (650*l.*); Mr. G. E. Spencer, Clerk, Board of Guardians, Keighley.

Larne.—Technical school, Victoria-street; Secretary, Education Committee, Larne Urban District Council.

Letchworth.—Four houses; Mr. J. C. Hoope, Surveyor, Hitchin Rural District Council.

Lincoln.—Children's home, Long Leys-road (1,287*l.*); Mr. A. J. Elms, builder, 129, North-street, Gainsborough.

Lowca.—School (2,500*l.*); Mr. C. C. Hodgson, Secretary, Education Committee, Cumberland County Council, Carlisle.

Mansfield. — School, Carter-lane (10,000*l.*), also extensions, Newgate-lane school (550*l.*); Mr. J. H. White, Secretary, Education Committee, Mansfield Town Council.

Methil.—Proposed school, Bayview; Wemyss School Board.

Panteg.—School (5,426*l.*); Messrs. Turford & Southward, builders, Gravel-hill, Ludlow.

Peterborough. — Extension, Deacon's School (3,789*l.*); Mr. John Cracknell, builder, Huntley-grove, Peterborough.

Peterhead.—Additions and alterations, North School, King-street (5,000*l.*); Burgh School Board.

Pontefract.—School (10,000*l.*); Mr. W. Haddock, Secretary, Education Committee, Pontefract Town Council.

Porthenry.—School (200 places); Mr. J. W. Nicholas, Secretary Education Committee, Carmarthenshire Education Committee, Carmarthen County Council.

Rochdale.—Proposed alterations and additions, police-station (827*l.*); Mr. S. S. Platt, Surveyor, Rochdale Town Council.

Scunthorpe.—Proposed village of 300 houses for Messrs. J. Lysaght, Ltd.

Stanghow.—Iron church and school; Guisborough Primitive Methodist Society.

Stanley.—Twelve houses (115*l.* each); Mr. R. Southern, builder, Dipton.

Swadlincote.—Alterations, premises, High-street, for the Maypole Dairy Company, Ltd.

Tollcross.—Extension to Wellshot School; Skettleston School Board.

Waterloo. — Swimming-baths; Mr. F. S. Yates, Surveyor, Waterloo with Seaforth Urban District Council.

West Dudo.—Asylum (114,000*l.*); Mr. N. P. Pattinson, Surveyor, Gateshead Town Council.

Weston-super-Mare. — Pavilion, Clarence Park; Surveyor, Weston-super-Mare Town Council.

Whitwick.—Hosiery factory; Messrs. Seal & Co., builders, Leicester.

Wolverhampton. — School (18,400*l.*); Mr. B. H. Preston, Secretary, Education Committee, Wolverhampton Town Council.

Yarmouth.—The Town Council has passed plans for a master's house, Marine Parade North, for the Grammar School Governors.

PROPOSED NEW ROAD, CROYDON.—A scheme for constructing a new road from Thornton Heath to Purley, by way of Waddon and Cold Harbour, is under the consideration of the Croydon Town Council, who have applied to the Roads Board for a contribution towards it. This new road, which would extend three and three-quarter miles, is estimated to cost 50,000*l.* If constructed, it would be 60 ft. wide.

*See also our list of Competitions, Contracts, etc., on another page.

STAINED GLASS & DECORATION.

REREDOS, CHICHESTER CATHEDRAL.

A carved oak reredos has been placed in Chichester Cathedral to the memory of Mrs. Hannah, wife of the Dean of Chichester. The reredos was designed by Mr. Somers Clarke, the Cathedral architect. Its principal figure is that of Christ upon the cross with angels in adoration, and crowned after the ancient manner. The figures were carved by Mr. John Tweed.

GENERAL BUILDING NEWS.

NEW CHURCH SCHOOLS, BRADFORD.

New schools have been erected in connexion with St. Stephen's Church, West Bowling, Bradford. The premises contain a lofty central hall, communicating with classrooms at the sides. The architect was Mr. T. L. Dixon, and the work will cost about 3,000*l.*

CONGREGATIONAL CHURCH, NORTHAMPTON.

A new Congregational church is in course of erection in this town. It stands on a site with frontages to Abington-avenue and Purser-road. The style selected by the architects is Decorated Gothic,' somewhat freely treated. The building comprises nave, with one centre and two side aisles, choir, organ-chamber, minister's vestry, choir vestry, and gallery at the Purser-road end. The total accommodation, 550, is provided as follows, viz., nave 440, gallery 72, choir 38. The walls externally are faced with local Duston stone, the windows, mouldings, plinths, copings, etc., are of Bath stone. The roofs will be covered with red sand faced tiles. The steps to the entrances and choir are of white Mansfield stone. The heating will be by hot water on the low-pressure system. The ventilation will be by patent ventilating panels in the aisles, and Barrol ventilators in the nave roof, and, in addition, there will be iron casements in the windows. The total cost of the building, boundary-walls, paths, etc., will be about 4,500*l.* The contractors are Messrs. E. D. Sharman & Son, Northampton, and the architects Messrs. Ernest R. Sutton and F. W. C. Gregory, of Nottingham.

NEW CHURCH, CRAGHEAD.

A new church is in course of erection at Craghead. The contract has been let to Mr. Dyson, builder, Pelton, and Mr. Thompson, of Newcastle, is the architect.

GRAMMAR SCHOOL, BARNSTAPLE.

New grammar school buildings have been erected at Barnstaple from plans prepared by Mr. Percy Morris, the Devon County Council Educational Architect. Accommodation is provided for 304 scholars, in two departments of 152 places each, for boys and girls, and the planning is such as to enable enlargement, if required, for 196 pupils in each department. The schools are built of best Wellington faced bricks, and the dressings, Wellington stone faced with Bath stone. The walls are plastered internally, and will have dados 3 ft. 10 in. high of "Granite Plaster," painted with Blundell Spence's petrifying liquid. The floors of the first floor are constructed by the Armoured Tubular Flooring Company, and those on the ground floor of concrete. The playground is tar paved, and the covered playground and bicycle shed is built of brick and the roofs boarded and covered with "Ruberoid." The cost of the school buildings, including offices, playgrounds, covered sheds, and fences, but exclusive of furniture, is estimated approximately at 9,000*l.*, and the accepted tender amounts to 9,413*l.* 7s. 8d. The builders are Messrs. Pollard & Co., Ltd., of Taunton. The clerk of works is Mr. J. Hill, of Barnstaple.

NEW GRAMMAR SCHOOL BUILDINGS, EVESHAM.

The new buildings for Evesham Grammar School, which has a foundation dating back to 1377, were opened a few days ago. The school is divided into two blocks, the main comprising the school proper, while the second block consists of gymnasium and manual and cookery rooms. The main block is planned with a large assembly hall, 56 ft. 9 in. by 32 ft. 3 in., around which are grouped six classrooms and the headmaster's and assistant masters' rooms. An art room is provided, and also chemical and physical laboratories. The buildings have been erected from plans by Messrs. Herbert T. Buckland and E. Haywood-Armer, of Norwich Union-chambers, Birmingham, by Messrs. Espley & Co., Ltd., of Evesham. The total cost has been about 12,000*l.*

COUNTY SCHOOL FOR GIRLS, NEWBURY.

A secondary school for girls has been erected by the Berks County Council in Andover-

road, Newbury. The building is designed by Mr. A. Jessop Hardwick, Fellow of the Royal Institute of British Architects, of Kingston-on-Thames, and erected by Mr. J. B. Seward, of Wokingham. The design is executed in red brickwork, relieved in its central parts by stone sparingly employed, and roofed with red sand-faced tiles. The school is planned on two storeys, with all the departments under one roof. Both floors have through corridors practically running from end to end, and connected by two staircases.

HIGHER ELEMENTARY SCHOOL, OGMORE.

The opening took place recently at Ogmore of a new higher elementary school. The building provides accommodation for 208 scholars in its six classrooms, which open into a central hall. Lecture-rooms, laboratories, and manual instruction and domestic science rooms are also provided. The schools were designed by Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff, under whose supervision the works have been executed by Messrs. F. W. Lougher & Co., of Pontycymmer, at a cost of 8,274*l.*

TECHNICAL SCHOOL, GARSTON, LIVERPOOL.

A new technical school has been erected by the Corporation in the Garston district, at a cost of about 8,000*l.* On the ground floor of the new premises there are three classrooms and a special room for cookery and laundry work. The accommodation on the first floor comprises three classrooms, a science lecture-room, and an office for the superintendent, whilst on the top floor are a room for practical bench work, another for practical science, in addition to a large art or examination room. The building has been faced with selected grey bricks, with red Ruabon terra-cotta dressings. The work has been carried out from plans prepared under the superintendence of the Corporation Surveyor, and the contractors were Messrs. Turner & Moss, of Garston.

SCHOOL, KILLAY.

A school, providing accommodation for 206 scholars, has been opened at Killay. The building consists of four classrooms and a central hall, together with teachers' room and the necessary cloakrooms. Dinner-rooms are also provided for. The school is heated throughout by hot-water, which work was carried out by Messrs. Beaven & Son, Ltd., Gloucester. The general contract was entrusted to Messrs. David Davies & Sons, Cardiff, at a cost of nearly 4,000*l.* Mr. David Williams acted as clerk of the works. The school was designed and built under the superintendence of Mr. W. James Nash, A.R.I.B.A., County Education Architect.

CHURCH HALL, GAINSBOROUGH.

A church hall has been opened in the parish of St. John's, Gainsborough. The hall has been specially fitted for the holding of church functions, and for the promotion of social effort, and has been built from the designs of Mr. W. Eyre, of Gainsborough.

EXTENSION OF FRUIT MARKET, HEREFORD.

An extension has been made to the Hereford wholesale fruit market. The additions comprise two buildings, each 70 ft. by 30 ft., with fronts constructed of brickwork, the remainder being of corrugated iron. The work has been carried out to the plans and specifications prepared by the City Surveyor (Mr. J. Parker). The brickwork and foundations have been done by Messrs. Bowers & Co., and the ironwork and roofing by Messrs. Alexander & Duncan.

NEW BUILDINGS IN LONDON.

Buildings, Hanover-street and Hanover-square, W.; Messrs. Godson & Sons, builders, Pembroke Works, Kilburn-lane, N.W. Buildings, on site covering more than half an acre, Farringdon-street, E.C.; Messrs. Farebrother, Ellis, & Co., agents, 29, Fleet-street, E.C.

CARNEGIE LIBRARY, DUMBARTON.

A free library has been erected in Strathven-place, Dumbarton, as the result of a gift of 6,000*l.* from Mr. Andrew Carnegie. The building is of white Dalreoch sandstone. The dimensions of the general reading-room are 41 ft. by 37 ft. There is seating accommodation for 112 readers. There are separate rooms for the reference and lending departments. In the basement are an extensive storeroom and strongroom, while upstairs is a committee room. The architect is Mr. William Reid, Church-street, Dumbarton. The contract work has been practically all by local hands.

TRADE NEWS.

The Partition Block Company supplied all the fireproof partitions for the new roller skating rink at 17, Brook Green-road, Hammersmith, which was briefly noticed in our issue of last week.

The Council school at Merle Common, near Oxted, Surrey, is being warmed and ventilated by means of D. O. Boyd's "Hygiastic" Ventilating School Grates, made by Messrs. O'Brien, Thomas, & Co., Upper Thames-street, London, E.C., and Excelsior Works, Rollins-street, Old Kent-road, S.E.

SANITARY AND ENGINEERING NEWS.

FERRO-CONCRETE BRIDGE, CEFN, MERTHYR TYDFIL.

A new bridge has been constructed over the river bridge at Cefn. The structure is composed of ferro-concrete, and was built by Messrs. E. H. Page & Co., contractors, Cardiff, after the designs of Messrs. J. G. Mouchel & Partners, Westminster. It is 170 ft. long and 33 ft. wide. The work was superintended by Mr. T. F. Harvey, Merthyr Borough Engineer, and Mr. Charles Best, Breconshire County Engineer.

BRIDGE, HUNTLY, N.B.

The Huntly District Committee of the Aberdeen County Council have had the Cairnford Bridge, over the River Deveron, on the main road leading from Huntly to Glass, improved and strengthened. Mr. James Barron, M.Inst.C.E., Aberdeen, was instructed to report and furnish a design to carry out the necessary improvements. The design which he submitted consisted of altering the girders and the erection of a new centre pier, substantially constructed of Portland cement concrete, and partly faced with ashlar masonry to resist the action of ice. A number of tenders were received for the work, and the tender of the Rose-street Foundry and Engineering Company, Ltd., Inverness, was accepted, the sub-contractor for the masonry of the pier and the macadam and concrete work of the roadway being Mr. A. Nicholson, Elgin.

BURNLEY'S NEW WATERWORKS AT HURSTWOOD AND CLIVIGER.

The Burnley Town Council, at a meeting on the 14th inst., decided to accept a recommendation of the Water Committee that the tender of Messrs. Macdonald & Deakin, Victoria-street, Westminster, S.W., to construct a reservoir and other waterworks at Hurstwood and Cliviger for the sum of 158,828*l.*, subject to a contract and a bond given by a satisfactory company being entered into a form to be approved by the Town Clerk.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.

Mr. Francis Osler, A.R.I.B.A., has taken an office at No. 5, Verulam-buildings, Gray's Inn, London, W.C., where he is carrying on his architectural practice.——Mr. Herbert Measures, iron and steel contractor and engineer, will be removing on the 27th inst. from his present address, 4, Exchange-parade, Southwark-street, S.E., to 110, Cannon-street, E.C.——The Vaughan Engineering Installations, Ltd., inform us that the connexion between themselves and Mr. T. W. Vaughan has been dissolved.

ROYAL SOCIETY OF PAINTER-ETCHERS AND ENGRAVERS.

The King has signified his approval of the election by the Council of Mr. Frank Short, A.R.A., as President of the Society in succession to the late Sir Francis S. Haden, founder of the Society, and its first President.

A NEW GREAT SEAL.

Consequently upon the decease of King Edward VII., a new Great Seal will be struck in the Mint, to take the place of that which was made upon the Accession of the late King, from a design prepared by Mr. de Saulles, and completed in 1903, after his death, by Mr. Frank Bowcher. The present Great Seal is of silver, having a diameter of 6 in., and superseded one made in 1900, during Queen Victoria's reign, at a cost of 400*l.*

"THE LITTLE THEATRE," ADELPHI.

Miss G. Kingston will open on October 11 the "Little Theatre" which has been constructed by Messrs. Macey & Sons, of Essex-street, W.C., contractors, after Messrs. Hayward & Maynard's designs, in John-street, Adelphi. The theatre is a conversion of the banking-hall of Messrs. Coutts & Co.'s former premises, being the back portion of the banking-house which Robert and James Adam built for the brothers James and Thomas Coutts. Thomas Coutts occupied that part as his residence for many years before his death in 1822. A subway beneath William-street afforded access to the strong-rooms and vaults beneath the banking-hall, and, in 1799, Thomas Coutts obtained an Act (39 George III., c. 1) to empower him "to make a communication between his buildings on the opposite sides of William-street . . . by a covered passage to be built over the said street." The bridge has been recently blocked up. The alterations made by Mr. George J. Drummond, the freeholder, comprise the absorption of part of No. 17, John-street for foyer, refreshment-rooms, etc., with an emergency exit in Durham House-street.

NEW VARIETY THEATRES, MUSIC-HALLS, ETC., LONDON.

The new buildings of the Palladium, in Argyll-street, will be opened in December next. They comprise a reconstruction, after Messrs. Frank Matcham & Co.'s designs, of Hengler's Circus, which was first opened as the Cirque in 1872, and, having been remodelled by C. J. Phipps, was reopened in January, 1896, as the National Skating Palace. The adjacent theatre, with studios, suites of offices, and saloon, has been erected on the site of Nos. 2-10, Hill's-place, and No. 225, Oxford-street, long occupied by Messrs. John Bell & Co., chemists and druggists, and distinguished for its fine old shop-front, with wooden shutters and small window-panes—one of the very few survivals after that kind in London. Mr. Melville S. Ward designed the new buildings for the London Cinematograph Company. The Finsbury Park Empire Theatre, at the junction of Prah and St. Thomas's roads, was opened a few days ago by Moss Empires, Ltd., having been built at a cost of some 45,000*l.*, from designs by Messrs. F. Matcham & Co., the architects, also, for the proposed Victoria Palace of Varieties, Victoria-street, S.W., and for the reconstruction, on the present site, and that of the adjoining Mogul tavern, for an audience of 2,700, of the Middlesex Music-hall (the "Old Mo'"), Drury-lane. It is announced that Mr. Oscar Hammerstein, of New York, will build an opera house, with 3,500 seats, and full provision for "popular prices," on a site in Kingsway, between Kemble and Keeley streets, and that at the end of the current month operations will be begun for the erection, in Aldwych and the Strand, of the Theatre and Palace of French Arts and Industries, of which the architect is M. Ernest Gérard, with whom is associated M. Duval. The site measures 430 ft. and 450 ft., with an average depth of 300 ft.; the estimated cost of the undertaking is 800,000*l.*, and the lease is for ninety-nine years at a rent—after the first four years—of 55,000*l.* per annum.

COST OF OLD BAILEY.

Up to the present 395,345*l.* has been expended on the Old Bailey, including 303,900*l.* on builders' contracts; site, 40,000*l.*; temporary cells, 5,320*l.*; cost of designs and fees to architect, surveyors, etc., 22,959*l.*; furnishing and getting up, 11,764*l.*; insurance, removal of human remains, etc., 941*l.*; compensation and redemption, and Parliamentary and legal expenses, 4,446*l.*; and expenses of issue of stock, 6,011*l.* A sum of 18,921*l.* has been applied towards the sinking fund.

GIFT OF A MUSEUM TO EYE.

At the small East Anglian borough of Eye a museum has been established in the Castle, which contains several of those antiquarian objects in which East Anglia is so rich, together with natural history and other specimens. The nucleus of the collection was formed in the Castle several years ago by the late Mr. Woolnough, who held the office of Town Clerk of Eye. On Mr. Woolnough's death last year his collection was bought by the Hon. Charles Hanbury and added to the museum, which has now been handed over to the town.

UNIVERSITY COLLEGE, LONDON.

The session of the School of Architecture at University College begins on Monday, October 3. In addition to the regular work of the school, the following public courses of lectures have been arranged, owing to the generosity of the Carpenters' Company:—A course of three lectures on town planning by Mr. H. V. Lanchester, F.R.I.B.A., beginning on Thursday, October 6, at 6 p.m. Mr. Robert Cobay, the Master of the Carpenters' Company, will preside at the opening lecture. A course of eight lectures on English Domestic Work by Mr. J. A. Gotch, F.R.I.B.A., beginning on Thursday, October 27, at 6 p.m. The design class that has been arranged to meet the needs of those already at work in architects' offices, and which is held under the direction of Professor Simpson and of the Special Visitors, Mr. Leonard Stokes and Mr. Ernest Newton, will meet on Mondays and Wednesdays at 6.45 p.m., beginning on Wednesday, October 5.

MISCELLANEOUS—*Continued on page 354.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xx; Auction Sales, xxvi.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that may occur.

Competitions.

OCTOBER 1.—**Antwerp.**—SCHEME FOR LAY-OUT OF SURROUNDINGS AND SITE OF FORTIFICATIONS ABOUT TO BE ABOLISHED.—Three premiums are offered, viz., 1,000*l.*, 400*l.*, and 200*l.* Conditions may be seen at Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, E.C., and obtained from the "Commission d'études de l'aménagement de l'agglomération anversoise," Rue du Jardin des Arbalétriers 57, Antwerp, on payment of 100 francs.

OCTOBER 1.—**Brighton.**—NEW BUILDINGS.—The Governors of the Brighton, Hove, and Sussex Grammar School require designs for their new buildings. For further particulars see advertisement in our issue of September 17.

OCTOBER 1.—**Denbigh.**—ERECTION OF A PUBLIC HALL, MARKETS, MUNICIPAL BUILDINGS, ETC.—The T.C. invite competitive plans and designs of a Public Hall, Markets, Municipal Buildings etc., which it is proposed to erect at a cost not to exceed 10,000*l.* Particulars, etc., may be obtained on payment of a deposit of 1*l.* 1*s.* Three premiums are offered, viz., 75*l.*, 30*l.*, and 20*l.*, as first, second, and third respectively. Mr. J. Parry Jones, Town Clerk, Denbigh.

OCTOBER 1.—**Essen.**—Design for a poster for a tin foundry. Prizes of 75*l.* and 50*l.*, for the two best designs, and five other prizes of 10*l.* each, are offered by M. Th. Goldschmidt, Director of the "Chemische Fabrik und Zinnhütte" at Essen, Germany.

OCTOBER 31.—**Romford.**—TOWN PLANNING, ETC.—The Town Planning and Modern House and Cottage Exhibition invite designs for houses, cottages, etc., also town plan of Gidea Park, Squirrels Heath, Romford. For further particulars see advertisement in our issue of September 17.

NOVEMBER 15. — **Ruislip-Northwood.** — TOWN PLANNING.—The Directors of Garden Estates, Ltd., invite designs for a town plan of estates of King's College, Cambridge, situated in the urban district of Ruislip and Northwood, Middlesex. Conditions and maps may now be obtained from Mr. Graham Kennedy, Secretary, Garden Estates, Ltd., 33, Henrietta-street, Strand. Deposit 1*l.* 1*s.* See advertisement in our issue of August 27.

NOVEMBER 29.—**Bangor, Co. Down.**—SEA-WATER BATHS.—The Bangor U.D.C. invite designs for baths to be built on the foreshore in conjunction with the existing sea-water pond at Pickie, at a cost of 7,050*l.* Premium 50*l.*, or to be merged into commission of 5 per cent. For further particulars apply to Mr. J. Milliken, Clerk to the Council, and see advertisement in issue of August 20.

DECEMBER 1. — **Bournemouth.** — REBUILDING PREMISES.—Competitive designs are invited from architects for rebuilding premises for Mr. J. E. Beale. Three premiums (100*l.* 50*l.*, and 25*l.*) are offered. For further particulars see advertisement in our issue of September 17.

DECEMBER 1.—**Dublin.**—New pavilion to the Royal Hospital for Incurables at Donnybrook. Open only to architects practising in Dublin. Premia 100*l.* (to be merged), 30*l.*, and 20*l.* Conditions on application to the Registrar.

DECEMBER 1.—**Manchester.**—LAYING-OUT ESTATE.—The Manchester Corporation invite designs for laying-out their Blackley Estate. Three premiums are offered, viz., 150*l.*, 100*l.*, and 50*l.* See our issue of September 3, page 264, for further particulars.

NOVEMBER 1, 1911.—**City of St. Petersburg.**—MONUMENT TO ALEXANDER II.—Particulars in our issue of August 13, 1910.

NO DATE.—**Llandudno.**—CHURCH.—Open to architects who have been in practice five years in North Wales and Chester. Conditions (1*l.* 1*s.* deposit, returnable if conditions are sent back in fourteen days) from the Rector, Llandudno. For further particulars see advertisement in our issue of September 3.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

SEPTEMBER 26.—**Nantymoel.**—BAKERY.—Nantymoel Industrial Co-operative Society, Ltd., proposed new bakery. Names and qualifications to the Chairman, Co-operative, Nantymoel.

SEPTEMBER 27.—**Dublin.**—ASSEMBLY HALL.—The erection of new assembly hall at 31, Rutland-square, West. Quantities can be obtained from Mr. James W. Mackey, surveyor, 58, Dame-street, and plans, etc., can be seen with the architect, Mr. Thomas F. McNamara, 50, Dawson-street.

SEPTEMBER 27.—**Plymouth.**—REPAIRS.—The Guardians invite tenders for painters', carpenters', and masons' work required to be done at certain of the Scattered Homes. Specification may be seen at offices of Mr. W. H. Davy, Clerk to the Guardians, Greenbank-road, Plymouth.

SEPTEMBER 28.—**Ennis.**—REPAIRS TO CATHEDRAL.—The Building Committee of the Parish invite tenders for relaying roof gutters, flashing, etc., to the cathedral, according to specifications prepared by Mr. Joseph O'Malley, B.E., architect, Limerick, which may be seen at his office, or at the Presbytery.

SEPTEMBER 28.—**Plymouth.**—COUNTY COURT OFFICES.—The Corporation invite tenders for the erection of County Court offices at the rear of the Guildhall, in accordance with the plans, etc., which can be seen, and forms of tender, etc., obtained, on receipt of a deposit of 2*l.* in cash. Conditions may be seen at offices of Mr. James Paton, Borough Engineer and Surveyor, Municipal Offices, Plymouth.

SEPTEMBER 28.—**Troedyrhiw, near Merthyr.**—REBUILDING INN, ETC.—The rebuilding of the Fox and Hounds Inn and three shops for the executors of Mr. Christmas Evans, Heolgerrig Brewery. Plans and specifications to be seen at No. 112, High-street, Merthyr.

SEPTEMBER 29.—**Ely, near Cardiff.**—WESLEYAN CHURCH.—The erection of a Wesleyan church, for the Trustees. Plans, etc., may be inspected, and quantities obtained, on payment of 2*l.* 2*s.* deposit, at the office of Mr. H. P. Sanders, architect, 10, Windsor-place, Cardiff.

SEPTEMBER 29.—**Saltash.**—RUBBLE EMBANKMENT.—The Corporation invite tenders for constructing a rubble embankment on the foreshore opposite Brunel-terrace. Plan may be seen at the Borough Surveyor's Office, Saltash, and specification and form of tender obtained from the Borough Surveyor.

SEPTEMBER 29.—**Sheffield.**—ALTERATIONS.—The Health Committee invite tenders for the erection of new galleries and structural alterations at Brightside and Park Baths. Drawings, etc., may be seen, and quantities, etc., obtained, on application to the City Architect, Town Hall, Sheffield.

* SEPTEMBER 30.—**Maidstone.**—PRINTING WORKS.—Messrs. Wm. Hobbs & Sons, Ltd., invite tenders for erection of printing works at Stone-street, Maidstone. See advertisement in this issue for further particulars.

SEPTEMBER 30. — **Thorne Moorends.** — SCHOOL ALTERATIONS AND ADDITIONS.—The West Riding Education Committee invite whole or separate tenders for alterations and additions to Thorne Moorends Council School. Plans may be seen, and specifications, with quantities, obtained, on application to the Education Architect, County Hall, Wakefield. 1*l.* in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield.

SEPTEMBER 30.—**Ulverston.**—HOUSES.—The erection and completion of twenty-four dwelling-houses in Lightburn-park, for Mr. James Arden, at whose office, 7, Union-street, Ulverston, plans, specifications, etc., may be inspected.

OCTOBER 1.—**Church Village.**—HALL.—The erection of a hall at Church Village, for the Efail Isha Congregational Church. Plans etc., may be seen at the office of Messrs Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

OCTOBER 1.—**Pontyclun.**—HOUSES.—Erection of fifteen houses for the Pontyclun Building Club. Plans, etc., may be seen at the office of Messrs Arthur Ll. Thomas & Gomer S. Morgan, architects and engineers, Pontypridd.

OCTOBER 3.—**Bishop's Stortford.**—ALTERATIONS, ETC.—The Guardians invite tenders for proposed alterations and additions to the laundry at the Workhouse. Specification may be obtained at the office of Mr. Alfred G. Gwynn, Clerk, 29, North-street, Bishop's Stortford, and a plan of the Guardians' proposals may be seen at he Workhouse upon application to the Master.

OCTOBER 3.—**Blakey Moor.**—POLICE-STATION, ETC.—The Corporation of Blackburn invite tenders for the erection of the new police-station, sessions court, etc., on Blakey Moor (Superstructure Section) Forms of tender, etc., can be obtained from the joint architects, Messrs. Briggs, Wolstenholme, & Thornley and Messrs. Stones & Stones & Atkinson, Richmond-terrace, Blackburn, on deposit of 1*l.* 1*s.*

OCTOBER 4.—**Lower Sydenham.**—BOUNDARY WALL.—Lewisham B.C. invite tenders for building a boundary wall at the Home Park depot. Plan, etc., may be seen, and forms obtained, at the Town Hall, Catford (Surveyor's Department).

* OCTOBER 5.—**Slough.**—SCHOOL.—The Bucks County Education Committee invite tenders for new secondary school at Slough. See advertisement in this issue for further particulars.

OCTOBER 6.—**Bolton-on-Dearne.**—ALTERATIONS TO COUNCIL SCHOOL.—The West Riding Education Committee invite whole or separate tenders for alterations to the boys' department of the Bolton-on-Dearne Goldthorpe Council School. Plans may be seen, and specifications, with quantities, obtained, on application to the Education Architect, County Hall, Wakefield. 1*l.* in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield.

OCTOBER 6.—**Southampton.**—ENLARGEMENT OF PIER PAVILION.—The Harbour Board invite tenders for the enlargement of the pavilion, Royal Pier. Specification, etc., may be seen upon application to Mr. E. Cooper Poole, A.M.Inst.C.E., Engineer and Surveyor to the Board, at the Board's offices, from 10 a.m. to 12 noon, and quantities, etc., may be obtained upon payment of 1*l.* 1*s.*

OCTOBER 6.—**Stanway.**—ELEMENTARY SCHOOL.—The Lexden and Winstree District Sub-Committee invite tenders for the erection of a new school at Stanway, for 260 children. Names to the Architect, Mr. J. W. Start, F.S.I., High-street, Colchester, A charge of 3*l.* 3*s.* will be made for a copy of the quantities.

* OCTOBER 10.—**Channel Islands.**—LIGHTHOUSES.—The Trinity House Corporation invite tenders for two lighthouses, one at Quenard Point, Alderney, and one at Cape Robert, Sark. See advertisement in this issue for further particulars.

OCTOBER 11.—**Chester.**—SECONDARY SCHOOL.—Tenders are required for the erection of a secondary school for boys and girls in Queen's Park. Plans, etc., can be seen at the office of the Architect, Mr. W. T. Lockwood, F.R.I.B.A., 88, Foregate-street, Chester, on or after the 30th inst., and quantities obtained on deposit of 1*l.*

OCTOBER 12.—**Maidstone.**—CART SHED, ETC.—A cart shed and scratching shed are to be erected on the Kent County Asylum farm, also glass roof over iron staircase adjoining Asylum buildings. Plans, etc., may be seen, by appointment, on personal application to the Engineer at the Asylum.

* OCTOBER 15.—**Lambourn, Berks.**—SCHOOL.—The Berks Education Committee invite tenders for building a new school for 100 children. See advertisement in this issue for further particulars.

* OCTOBER 17.—**Chester.**—NEW ANNEXE.—The Committee of Visitors, Upton Asylum, Chester, invite tenders for new annexe for 440 patients. See advertisement in this issue for further particulars.

* OCTOBER 18.—**Enfield.**—SCHOOLS.—The Enfield Education Committee invite tenders for a block of schools in Southbury-road, Enfield. See advertisement in this issue for further particulars.

NO DATE.—**Brampton, near Carlisle.**—HOUSE.—For the various works required in the erection of a house at Howgate, Brampton, near Carlisle. Names to Messrs. Nelson & Brindle, architects, 22, Lowther-street, Whitehaven.

NO DATE.—**Lealholm.**—COTTAGES, ETC.—Erection of three cottages, and also for the alterations and additions to other property at Lealholm, for Sir Francis Ley, Bart. Drawings etc., may be seen at the office of Mr. Arthur E. Young, architect and surveyor, 77, Baxtergate, Whitby. Quantities and specifications will be forwarded to applicants.

NO DATE.—**Leeds.**—PLASTERERS', SLATERS', AND PAINTERS' WORK.—Tenders are invited for the plasterers', slaters', and painters' work required in the erection of twenty through houses, Luxor View, Harehills, Leeds. Particulars, plans, etc., to be had at Enfield Works, Roundhay-road, Leeds.

NO DATE.—**Norwich.**—ALTERATIONS, ETC., TO SCHOOL.—Alterations and additions to Halvergate non-provided school. Applications to be addressed to Messrs. Lacey & Upcher, architects and surveyors, 6, Upper King-street, Norwich, where plans and specification can be seen, and quantities obtained.

ENGINEERING, IRON, AND STEEL.

SEPTEMBER 26.—**Lytham.**—IRON RAILINGS AND CONCRETE KERB.—The U.D.C. invite tenders for providing and fixing iron railings, and constructing a concrete kerb and sandshields on the Promenade. Plans may be seen, and specification, etc., obtained, at the office of the Surveyor to the Council.

SEPTEMBER 26.—**Ynyswen.**—TEMPORARY IRON SCHOOL BUILDINGS.—The Rhondda U.D.C. invite tenders for the provision and erection of iron classrooms. Particulars and conditions may be obtained upon application to Mr. Jacob Rees, Architect, Hillside Cottage, Pentre, at which address the design may also be seen.

SEPTEMBER 27.—**Harrogate.**—COVERED SHELTER.—For a covered shelter in the Crescent Gardens, Harrogate. Drawings, etc., may be inspected at office of Mr. F. Bagshaw, Borough Surveyor, Municipal Offices, Harrogate.

SEPTEMBER 29.—**Bletchingley.**—HEATING.—The Godstone Guardians invite schemes for heating the Infirmary at the Workhouse, Bletchingley, by hot water, together with a hot-water supply. Plans and particulars of the buildings may be obtained on application to Mr. George H. Widger, at his office, New Oxted.

SEPTEMBER 30.—**Tiverton.**—HOT-WATER INSTALLATION.—The Education Committee invite tenders for a hot-water installation at the Heathcoat Schools. Full particulars, with specification, etc., may be obtained from Mr. J. Siddolls, Architect to the Education Committee, on payment of 1*l.* 1*s.*

ENGINEERING, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

OCTOBER 1.—**Northallerton.**—RECONSTRUCTION OF BRIDGES.—The Directors of the North-Eastern Railway invite tenders for the reconstruction of two bridges at Northallerton Station. Plans may be seen, and specifications, etc., obtained, on personal application at the office of Mr. C. Bengough, the Company's Engineer, at York.

OCTOBER 3.—**Wimbledon.**—SEWER VENTILATING COLUMNS.—The Council invite tenders for the supply of sewer ventilating columns. Particulars and form of tender to be obtained on application at the Borough Surveyor's Office, Town Hall, Wimbledon.

OCTOBER 6.—**Leeds.**—FENCING.—The Sewerage Committee invite tenders for the supply and erection of about 1,300 lin. yds. of wrought-iron continuous fencing (contract No. 28). The specification, etc., can be seen at the office of the Sewerage Engineer, Mr. Geo. A. Hart, Great George-street, Leeds. Copies of the schedule of prices and form will be supplied to applicants upon receipt of a deposit of 2*l*.

OCTOBER 6.—**Leeds.**—PIPES, ETC.—The Sewerage Committee invite tenders for the supply of about 1,000 tons of cast-iron pipes, bends, junctions, and other specials, to be delivered at their sewage works at Knostrop, Leeds (contract No. 27). Copies of the contract documents can be obtained at the office of the Sewerage Engineer, Mr. Geo. A. Hart, Great George-street, Leeds, upon payment of a deposit of 10*l*.

OCTOBER 10.—**Dublin.**—RAILWAY MATERIAL.—The Directors of the Great Northern Railway Company (Ireland) invite tenders for the supply of bull head rails, fishplates, and cast-iron chairs. Specifications and forms can be obtained from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin.

OCTOBER 10.—**Edinburgh.**—ELECTRICAL PLANT.—The Corporation invite tenders for the following work in connexion with their electricity supply station at Dewar-place:—Specification No. 59, steam turbines, direct current generators, and condensing plant; specification No. 60, interior parts of cooling towers. Specifications, etc., can be obtained from the Engineer, Dewar-place, Edinburgh, upon deposit of 2*l*. 2*s*. for each specification. The specifications, general conditions, and drawings may be seen at, but not obtained from, the office of Sir Alexander Kennedy, 17, Victoria-street, London, S.W.

OCTOBER 11.—**Catford, S.E.**—BRIDGE RECONSTRUCTION.—The London C.C. invites tenders for the reconstruction of Catford Bridge, carrying Catford-hill over the River Ravensbourne and the South-Eastern and Chatham Railway (Mid-Kent Line). Drawing, etc., may be obtained on application to the Chief Engineer of the Council, Mr. Maurice Fitzmaurice, C.M.G., at the County Hall, Spring-gardens, S.W., on payment to the cashier of the Council of 3*l*.

OCTOBER 17.—**Margate.**—DUST DESTRUCTOR.—The Corporation invite tenders for the erection of a dust destructor. Full particulars can be obtained on application to Mr. E. A. Borg, Borough Surveyor, 13, Grosvenor-place, Margate.

NOVEMBER 8.—**Portumna.**—BRIDGE REBUILDING, ETC.—The Committee of Superintendence invite tenders for the rebuilding of Portumna Bridge, over the River Shannon, connecting the Counties of Tipperary and Galway Bridge, and reconstruction of approaches. Plans, etc., may be seen, and specification, etc., obtained, on deposit of 10*l*. 10*s*., at the office of the County Surveyor of the North Riding of Tipperary, Court House, Nenagh. A limited number of copies of the drawings are available on payment of 3*l*. 3*s*. each set, not returnable.

MISCELLANEOUS.

SEPTEMBER 26.—**Sittingbourne.**—SKATING RINK FLOOR.—The U.D.C. invite tenders for providing and laying a hardwood floor at the gymnasium, Sittingbourne, in accordance with a specification which can be seen, and an examination of the building made, on application to Mr. W. Leonard Grant, Surveyor, Sittingbourne.

SEPTEMBER 26.—**Wigton.**—MAPLE FLOOR.—The U.D.C. invite tenders for the laying down of maple floor at the Council's swimming-bath. Plan, etc., may be seen at the Council's Office.

SEPTEMBER 27.—**Inverness.**—BOWLING GREEN.—Tenders are wanted by the Inverness T.C. for the construction of a bowling green at Planefield-road. Plans, etc., may be seen, and quantities obtained, at the office of Mr. T. H. Scott, C.E., Burgh Surveyor, on payment of 5*s*.

SEPTEMBER 27.—**Uxbridge.**—STEAM ROLLING AND SCARIFYING.—The U.D.C. invite tenders for steam rolling and scarifying. Mr. W. T. Harvey, Clerk to the Council, Council Offices, 126, High-street, Uxbridge.

SEPTEMBER 27.—**Walsingham.**—HIRE OF STEAM ROLLER.—The R.D.C. invite tenders for the hire of a 10-ton steam roller for use upon their roads. Further particulars and forms may be had on application to Mr. Robert Cannan, Surveyor, Fakenham.

SEPTEMBER 27.—**Woking.**—TEAM LABOUR.—The U.D.C. invite tenders for the haulage of road materials, etc.; also for road watering, scavenging, etc. Forms of tender and further particulars may be obtained of Mr. G. J. Wooldridge, Surveyor, Council Offices, Woking.

SEPTEMBER 28.—**Cliftonville, Margate.**—DEMOLISHING BUILDINGS.—The Metropolitan Asylums Board invite tenders for demolishing the buildings known as Le Château Bellevue, adjoining Eastcliff House. The conditions, etc., may be inspected at Eastcliff House, or at the office of the Board, Embankment, E.C., and can be obtained at the latter place upon deposit of 1*l*.

SEPTEMBER 28.—**Dublin.**—FURNISHING.—The Public Libraries Committee invite tenders for furniture and fittings for the new Public Library at Great Brunswick-street, in accordance with plans, etc., which can be seen at the office of the City Architect, Municipal-buildings, Cork-hill. A copy of the specification, etc., can be obtained in the office of the City Treasurer on payment of 1*l*.

SEPTEMBER 28.—**Farnworth.**—WOOD-BLOCK FLOOR AND FURNISHING.—The U.D.C. invite tenders for labour and materials required in laying wood-block floors at the Carnegie Library; also for the construction, erection, and supply of furniture. Specifications, etc., may be obtained from the architect, Mr. Walter J. Lomax, 11, Fold-street, Bolton, on deposit of 2*l*.

SEPTEMBER 28.—**Hetton.**—FURNISHING.—The U.D.C. invite tenders for the supply and fixing of furniture for their new Council chambers and offices. Plan, etc., may be seen, and information obtained, by making an appointment with the Surveyor, Mr. John Harding, Township Offices, Hetton-le-Hole.

SEPTEMBER 29.—**Saltash.**—BATHING SLIP.—The Corporation invite tenders for making a bathing slip on the foreshore, near the New-road. Plan and specification of the work may be seen at the Borough Surveyor's Office.

SEPTEMBER 30.—**Clitheroe.**—LEVELLING.—Tenders are invited for levelling a plot of land, situated at Eddisford Bridge, one mile from Clitheroe, to be made suitable for a polo ground. For full particulars apply to Mr. James Williams, Waddington Hall, Clitheroe.

OCTOBER 3.—**Dublin.**—LAUNDRY FITTINGS, ETC.—The Public Health Committee invite tenders for the work of refitting the Public Wash-houses at Tara-street. Plan, etc., may be obtained at the office of the City Treasurer, Municipal Buildings, Cork-hill, Dublin, on payment of 2*l*.

✱ OCTOBER 3.—**Tottenham, N.**—TAR-PAVING, ETC.—The Tottenham Education Committee invite tenders for the following works:—Tar-paving, wood-block flooring, roller window blinds, stoves and ranges, hot-water heating apparatus. See advertisement in this issue for further particulars.

OCTOBER 4.—**Leeds.**—GATES.—The Corporation invite quotations for supplying, etc., No. 14 wooden creosoted and painted palisade field and other gates, with posts and all necessary ironwork, in accordance with specification and drawings, to be seen at office of Mr. Geo. A. Hart, Sewerage Engineer, Great George-street, Leeds.

OCTOBER 5.—**London.**—WOOD.—The Directors of the Great Western Railway invite tenders for the supply of English ash butts, elm butts, planks and boards, poplar planks, and oak butts and scantlings. Specification, with form, may be obtained on application to Mr. A. E. Bolter, Secretary, Paddington Station, London.

OCTOBER 6.—**Upper Holloway, N.**—FIRE ALARMS, ETC.—The Guardians of the parish of St. Mary, Islington, invite tenders for providing and fixing bells, fire alarms, and telephones at the St. John's-road Workhouse, in accordance with specification, copy of which may be obtained, with form of tender, on application to the Master of the Workhouse, up to September 30, on deposit of 2*l*.

OCTOBER 11.—**Crossness.**—REMOVAL OF ASHES, ETC.—The London C.C. invites tenders for the removal and disposal of an accumulation of furnace ashes, clinker, dust, and similar refuse, from the main drainage outfall works on the River Thames at Crossness, near Belvedere, Kent. Forms of tender, with particulars of the work, may be obtained on application to the Chief Engineer of the Council, Mr. Maurice Fitzmaurice, C.M.G., at the County Hall, Spring-gardens, S.W.

NO DATE.—**Burnley.**—HAULAGE.—Haulage to let, Hurstwood Reservoir, Burnley. Apply for particulars to Messrs MacDonald & Deakin, contractors, Sutton, St. Helens.

PAINTING, etc.

SEPTEMBER 26.—**Darlington.**—PAINTING.—The Committee of the Darlington Hospital and Dispensary invite tenders for outside painters' work at their Institution. A specification may be seen on application at the Hospital.

SEPTEMBER 26.—**Sunderland.**—PAINTING.—The Corporation invite tenders for the outside painting, etc., of the Victoria Hall, etc. Specification may be seen, and schedule, etc., obtained, at the Borough Surveyor's Office, Town Hall.

OCTOBER 1.—**West Bromwich.**—PAINTING, ETC.—Tenders are required for painting, etc., at the district schools, Wigmore, West Bromwich. Specification, etc., may be seen, and forms of tender obtained, at the office of Mr. C. W. D. Joynson, Architect, Wednesbury, on and after the 27th inst.

✱ OCTOBER 13.—**London, N.**—REPAIRS AND PAINTING.—The Guardians of St. Pancras invite tenders for external repairs and painting at North Infirmary, Dartmouth Park-hill, N. See advertisement in this issue for further particulars.

ROADS, SANITARY, AND WATER WORKS.

SEPTEMBER 26.—**Thornton Heath, Surrey.**—TARRING AND SANDING.—Croydon Guardians invite tenders for tarring and sanding old asphalt at the Infirmary, Mayday-road. Specification can be seen at the office of Mr. Henry Berney, Architect and Surveyor, 104, George-street, Croydon, Surveyor to the Guardians.

SEPTEMBER 27.—**Bedwas.**—ALTERATION TO ROAD.—The Monmouth Main Roads and Bridges Committee invite tenders for the alteration of the main road at Bedwas. Plans, etc., may be seen at the office of Mr. William Tanner, F.S.I., County Surveyor, Newport, Mon., and a copy of the quantities obtained on payment of 1*l*. 1*s*.

SEPTEMBER 27.—**Withington.**—ASPHALTING, ETC.—The Guardians of the Chorlton Union invite tenders for the asphalting, etc., of the exercise yards, walks, etc., connected with the lunatic wards at their Workhouse. Mr. David S. Bloomfield, Clerk to the Guardians, Union Offices, All Saints', Manchester.

SEPTEMBER 29.—**Oldham.**—SEWERING, PAVING, ETC.—The Surveyor's Committee invite tenders for the sewering, paving, flagging, and completing of Watersheddings-street; also for the sewering, paving, and completing of a number of passages. Plans, etc., can be seen, and quantities and forms obtained, at the Borough Surveyor's Office.

OCTOBER 1.—**Coppull.**—ROAD RECONSTRUCTION.—The R.D.C. of Chorley invite tenders for the reconstruction of Spendmore-lane. Conditions, etc., may be obtained from Mr. Percival Whalley, District Surveyor, 5, High-street, Chorley, on payment of 1*l*. 1*s*.

✱ OCTOBER 3.—**London.**—WIDENING FOOTPATH.—The Council of the Royal Borough of Kensington invite tenders for widening footpath, etc., at Brompton. See advertisement in this issue for further particulars.

OCTOBER 4.—**Ealing.**—PRIVATE STREET IMPROVEMENTS.—The T.C. invite tenders for the making-up of the following:—Pitshanger-lane; accommodation road adjoining the North Star public-house; accommodation road rear of Nos. 4-9, Castle Hill-parade; alley rear of Nos. 21-31, Haven-lane; alley between Nos. 107-109, Seaford-road. Drawings, etc., may be seen, and forms and other particulars obtained, from Mr. Charles Jones, M.Inst.C.E., Borough Engineer, Town Hall, Ealing, W., upon deposit of 10*s*. 6*d*. for each road.

OCTOBER 4.—**North Sheen.**—RELIEF SEWERS.—Richmond Main Sewerage Board invite tenders for the construction, completion, and maintenance of certain sewerage works in the parish of North Sheen (contract No. 4). Specification, etc., may be inspected at the office of Mr. William Fairley, civil engineer, 69, Victoria-street, Westminster; also at the Main Drainage Works, West Hall-road, Kew Gardens. Quantities and form of tender may be obtained on deposit of a crossed cheque for 3*l*. 3*s*., made payable to the Board.

OCTOBER 5.—**Nether Silton.**—WATERWORKS.—The Northallerton R.D.C. invite tenders for the providing and laying water main, together with storage reservoir, standpipes, etc. Plans, etc., may be seen at the office of the Surveyor of Highways, Northallerton (one day's notice being given).

OCTOBER 7.—**Bentham.**—ASPHALTING.—The West Riding Education Committee invite tenders for asphalting of playgrounds, Lower Bentham Council School. Plans may be seen, and specifications, with quantities, obtained, on application to the Education Architect, County Hall, Wakefield. A sum of 1*l*. must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield.

OCTOBER 7.—**Richmond, Yorks.**—PAVING.—The Corporation invite tenders for excavating, draining, relaying of flags, with the necessary cementing, channelling, and laying of maple blocks of Market Hall floor. Plans and full particulars may be seen at the office of Mr. H. W. Marsden, Borough Surveyor, Town-street, Richmond, until the 29th inst.

✱ OCTOBER 10.—**Wandsworth.**—MAKING-UP AND PAVING.—The Wandsworth B.C. invite tenders for making-up and paving several new streets. See advertisement in this issue for further particulars.

OCTOBER 11.—**London.**—ROADWORK AND PLATE-LAYING.—The London C.C. invites tenders for the roadwork and plate-laying required for the reconstruction on the conduit system of the Council's tramways in Highgate-road, and for the paving works of certain street widenings in connexion therewith. Specifications, etc., may be obtained on application to the Chief Engineer of the Council, Mr Maurice Fitzmaurice, C.M.G., at the County Hall, Spring-gardens, S.W., upon payment to the cashier of the Council of 5*l*.

OCTOBER 12.—**Louth.**—SEWERAGE AND SEWAGE DISPOSAL.—The Corporation invite tenders for the construction of about 6¾ miles of iron and earthenware pipe sewers, with manholes, detritus, sewage and storm-water tanks, bacteriological filters, etc. Plans, etc., may be seen, and forms and quantities obtained, either at the office of Mr. Baldwin Latham, M.Inst.C.E., Parliament-mansions, Victoria-street, Westminster, or at the office of Mr. Thos. Falkner Allison, Town Clerk, Town Hall, Louth, Lincolnshire, on deposit of 10*l*.

OCTOBER 13.—**Goldington and Renhold.**—WATER SUPPLY.—Bedford R.D.C. invite tenders for Goldington and Renhold water supply, comprising the laying of five miles of 5-in., 4-in., and 3-in. cast-iron mains, with sluice valves, etc. Drawings, etc., may be seen, and forms obtained, at the office of the R.D.C., No. 115, High-street, Bedford, or that of Mr. Arthur J. Martin, M.Inst.C.E., F.G.S., 7, Victoria-street, Westminster, on deposit of 3*l*. 3*s*.

OCTOBER 29.—**Bishop Auckland.**—SEWERAGE AND SEWAGE-DISPOSAL WORKS.—The U.D.C. invite tenders for the provision, etc., of cast-iron spigot and socket pipe, and stoneware pipe sewers, together with manholes, etc., also for the construction of liquefying and stormwater tanks, bacteria beds, sludge lagoons, and other incidental works. Drawings, etc., may be seen, and quantities obtained, at the offices of the Engineers, Messrs. Willcox & Raikes, MM.Inst.C.E., 63, Temple-row, Birmingham, on or after October 1, on deposit of 5*l*. 5*s*.

STONES, MATERIAL, AND STORES.

SEPTEMBER 26.—**Burton-on-Trent.**—STORES.—The Guardians invite tenders for the supply of granite and carting. Estimates of quantities required, etc., and forms of tender, may be obtained on application to Mr. C. F. Chamberlin, Clerk to the Guardians, Union Offices.

SEPTEMBER 27.—**Epsom.**—IRONMONGERY.—The Guardians invite tenders for the supply of ironmongery. Form to be had of Mr. Alick G. Ebbutt, Clerk, "Gynsdale," Waterloo-road, Epsom.

SEPTEMBER 27.—**Halifax.**—STORES.—The Guardians invite tenders for the supply of various materials. Estimates of the quantities likely to be required, and forms of tender, may be obtained at the offices of Mr. Arthur T. Longbotham, Solicitor and Clerk to the Guardians, Union Offices, Caritonstreet, Halifax.

SEPTEMBER 27.—**Leeds.**—STORES.—The Guardians invite tenders for the supply of stores. Forms may be had on application at the office of Mr. James H. Ford, Clerk to the Guardians, Poor Law Offices, South-parade, Leeds, or will be sent on receipt of stamped addressed foolscap envelope.

STORES, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

SEPTEMBER 27.—**Wolverhampton.**—SUPPLIES.—The Guardians invite tenders for the supply of ironmongery, paints, etc. Lists and particulars of all the articles, with forms, may be obtained from the office of Mr Frank Harrison, Clerk to the Guardians, Poor Law Offices, Wolverhampton.

SEPTEMBER 27.—**Woodford.**—BROKEN GRANITE.—The U.D.C. invite tenders for the supply of broken granite (Guernsey or Quenast). Particulars and forms of tender may be obtained from Mr. William Farrington, Surveyor to the Council, Council Offices, Woodford Green, Essex.

SEPTEMBER 28.—**Ipswich.**—STORES.—The Visiting Committee of the Ipswich Borough Mental Hospital invite tenders for the supply of ironmongery, earthenware, clothing, colours, etc. Tender forms may be obtained upon application to the Clerk and Storekeeper, at the Hospital, Foxhall-road.

SEPTEMBER 30.—**Aberdeen.**—STORES.—The Harbour Commissioners invite tenders for supplying various materials. Schedules will be delivered to intending contractors at the Harbour Engineer's Office, Aberdeen.

OCTOBER 1.—**Werrington, Stoke-upon-Trent.**—IRONMONGERY.—The Managers of the Certified Industrial (Boys') School invite tenders for the supply of ironmongery, etc. Forms of tender may be had on application at the school, where samples may be seen.

* OCTOBER 3.—**London.**—GENERAL STORES.—The Metropolitan Railway Company invite tenders for supply of general stores during twelve months ending October 31, 1911. See advertisement in this issue for further particulars.

OCTOBER 3.—**Manchester.**—RAILWAY STORES.—The Directors of the Lancashire and Yorkshire Railway invite tenders for the supply of stores. Further particulars and forms of tender may be obtained on application to Mr. Waring, Stores Department, Osborne-street, Manchester.

OCTOBER 3.—**Rosslynlee.**—STORES.—Tenders are invited for supplying the Mid-Lothian and Peebles District Asylum with timber, ironmongery, plumber's material, electric fittings, etc. Forms of tender can be had by applying to the Clerk and Treasurer, 19, Heriot-row, Edinburgh.

OCTOBER 5.—**Birkenhead.**—RAILWAY STORES.—The Directors of the Mersey Railway Company invite tenders for the supply of stores. Forms of tender may be obtained from Mr. J. Shaw, General Manager and Secretary, Central Station, Birkenhead.

NO DATE.—**Skipton.**—STONE.—The R.D.C. invite tenders for getting and breaking stone for the Oughtershaw Top Road (Buckden). Form of tender may be had from Mr. A. Rodwell, Surveyor, Skipton.

Public Appointments

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*DISTRICT SURVEYORS	London County Council	See advertisement in this issue	Oct. 10
*TECHNICAL ASSISTANT (Surveyor's Dept.)	Metropolitan Police	115*l.* per annum	No Date

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, BOARDS, TIMBER, ETC.—Great Hall, Winchester House, E.C.	Churchill & Sim	Sept. 28
*FREEHOLD BUILDING SITE.—SOUTHEND-ON-SEA.—At the Mart	C. C. & T. Moore	Sept. 29
*CONTRACTOR'S WORKS, ETC.—STOCKPORT.—Warren Bulkeley Arms Hotel, Stockport	John Bateman	Sept. 30
*FREEHOLD PROPERTY, LIVERPOOL.—At the Mart	Edwin Fox, Bousfield, Burnetts, & Baddeley	Oct. 3

MISCELLANEOUS—*Continued from page 351.*

MEMORIAL STATUE TO GENERAL WOLFE.

We hear that a bronze statue of Wolfe is to be erected at Westerham, his birthplace. The Memorial Committee has entrusted the task of executing the statue to Mr. F. Derwent Wood, A.R.A. This is the first statue of Wolfe to be erected in the British Empire. The figure will represent the famous young soldier as he appeared just prior to receiving the fatal bullet in the moment of victory. The fund is now all but completed, less than 200*l.* being required. If no unforeseen obstacles occur, the unveiling will take place on January 2 next, the hero's birthday.

ASSESSMENT OF MACHINERY.

Our readers who are manufacturers and machinery users should note that the quinquennial revaluation of London is not yet completed, notwithstanding that, in several of the London boroughs, the new Valuation Lists were formally deposited by June 1 this year. In many cases where these new Valuation Lists were so deposited the Union valuers at that date had not visited or revalued the properties, and that, therefore, the figures therein were not those which the ratepayer may be assessed at, because it will be found that a great number of assessments will be altered and increased when the Valuation Lists are redeposited. They then remain for inspection for seven days only, at the expiration of which time they will be irrevocably closed for the next five years. A very large majority of the machinery users of the Metropolis are members of the Machinery Users' Association, and their interests in connexion with this matter will be fully protected. We are asked to notify that the secretary will be pleased to give information for the guidance of those who are not members of this Association.

GOVERNMENT BUILDING CONTRACTS.

The following tenders have been accepted by the Government Departments named:—*Admiralty, Works Department:* Erection of detention quarters, R.N. Barracks, Chatham—Messrs. Wm. Moss & Sons, Ltd., Meadway, Hendon; removing existing timber wharf and reconstructing same in ferro-concrete, at Turnchapel—Mr. E. R. Lester, 13, Whitefield-terrace, Plymouth. *War Office:* Additions, etc., Maryhill Barracks, Glasgow—Messrs. S. Stevenson & Co., 59, Logan-street, Rutherglen, Glasgow; alterations and additions, Depôt Barracks, Warrington—Mr. R. Holt, 50, Badger-street, Bury; erection of annexes, Arbour Hill Barracks, Dublin—Messrs. J. & R. Thompson, Ltd., Fair View, Dublin; erection of annexes, Cork Barracks—Mr. T. Kelleher, 4, Millerd-street, Cork; erection of lecture-hall, etc., Aldershot—Mr. Jas. Crockerell, Stanhope Lines, Aldershot; erection of married soldiers' quarters, Fort George—Messrs. W. Finlayson & Sons, Pilrig Works, Balfour-street, Leith; erection of mobilisation storehouse, Richmond Barracks, Dublin—Messrs. McRoberts & Armstrong, Belfast; erection of officers' mess, Cork—Messrs. Collen Bros., Ltd., East Wall, Dublin. *Office of Works:* Heating, etc., Holloway Money Order Department, heating and hot-water services—Brightside Foundry and Engineering Company, Ltd., Wicker Works, Sheffield; steam boilers at Holloway Money Order Department—Messrs. Hawksley, Wild, & Co., Ltd., Sheffield; heating, National Gallery, East Wing—Messrs. H. J. Cach & Co., Ltd., Caxton House, S.W.; builders' work, alterations, etc., late Archbishop's House, Carlisle-place—Messrs. J. Simpson & Son, 48, Paddington-street, W.; enlargement of Chesterfield Post-office—Messrs. F. T. Salmon & Co., Cudworth, Barnsley; erection of Chislehurst Post-office—Messrs. F. Webster & Son, Grove Vale Works, East Dulwich, S.E.; alterations to staircases, Somerset House—Messrs. J. & M. Patrick, Point Pleasant Wharf, Wandsworth, S.W.; erection of new sorting-office, Stoke Newington — Messrs. Howell J. Williams, Ltd., 11-17, Bermondsey, S.E. *Commissioners of Woods:* New cottages and farm buildings—Mr. T. Shallcross, Ashton, near Chester. *Commissioners of Public Works, Ireland:* Building works: Extension and alteration to Galway Post-office—Mr. Timothy Emerson, Devon-place, Galway; erecting the superstructure of new plant houses, and installing a heating apparatus, Royal Hospital, Kilmainham, Dublin—Messrs. W. Richardson & Co., Darlington.

CAPITAL AND LABOUR.

CONDITION OF EMPLOYMENT IN THE BUILDING TRADES.

Employment in August was moderate, rather better than a month ago, and much better than a year ago. The percentage of trade union carpenters and joiners unemployed at the end of August was 5·0, as compared with 5·5 a month ago, and 9·6 a year ago; and for plumbers at the same dates the percentages were 8·8, 10·3, and 13·3. The decrease in the percentages unemployed as compared with a year ago was most noticeable in Scotland and the Northern Counties, where many of the trade union members are engaged in shipbuilding, and where the percentages unemployed a year ago were very high. Returns from trade unions of bricklayers and masons showed little general change in employment compared with a month ago. With painters a decline was shown, while with plasterers, slaters, and labourers there was a slight improvement. Compared with a year ago, a general improvement was shown. For London, the trade union returns show that 5·0 per cent. of carpenters and joiners were unemployed at the end of August, as compared with 6·9 a month ago, and 10·0 a year ago. The corresponding percentages for plumbers were 8·4, 14·6, and 13·2. Employment was moderate on the whole in most of the large centres. It was rather better than a month ago, except with painters, who reported a continued decline. Returns received from firms employing 62,906 workpeople at the end of August show that, as compared with a month ago, there was an increase in the total number employed by them of 13·6 per cent. in London, and of 2·3 per cent. in other districts.—*Board of Trade Labour Gazette.*

PATENTS.

APPLICATIONS PUBLISHED.*

16,764 of 1909.—Edward Curran: Furnaces for heating steel or iron plates, angle irons, and the like.

19,282 of 1909.—Frederick Edwin Clark and Arthur Johnson: Machine for dipping and glazing bricks, tile, pottery ware, and like articles.

19,340 of 1909.—George Henry Dunlop: Excavating machinery.

20,374 of 1909.—Henry Smith and James Pennington: Machines for boring earth and rock.

23,031 of 1909.—Samuel Rowland Parkes and Edmund Sidebottom: Sash pulleys and the manufacture of the same.

23,082 of 1909.—Harry James Yates: Gas fires.

23,996 of 1909.—Joseph Freeman Goddard: Compositions for building and like purposes.

26,543 of 1909.—Llewelyn Thomas Jones and Samuel Sharpe: Guides and workholders for grindstones.

2,848 of 1910.—John Thomas Medlicott Burgess: Stair-rods.

7,164 of 1910.—Helene Dornheim: Devices for use in dusting or cleaning rooms or other places.

7,286 of 1910.—Francis Henry Crittall: Jointing metal sash-bars.

12,382 of 1910.—Frederick George Mansfield and Horace Rendell Mansfield: Wastes for lavatories, baths, and the like.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

September 1.—By FRANCIS PETTIS & SON (at Yarmouth).

Freshwater, Isle of Wight.—Hookhill Farm, 49 a. 3 r. 32 p., f.	£1,200
Grazing land, 24 a. 1 r. 19 p., f.	900
Building site, 1 a., f.	270
Part of Brambles Farm, 30 a. 2 r. 36 p., f.	1,175
Hill Farm, 175 a. 3 r. 18 p., f.	4,000

September 13.—By S. & G. KINGSTON (at Spalding).

Moulton St. James, Lincs.—Decoy Farm, 94 a. 2 r. 24 p., f.	5,500
Four cottages and 2 r. 20 p., f.	220

* All these applications are in the stage in which opposition to the grant of a patent upon them may be made.

Moulton Chapel, Lincs.—Pasture and arable land, 11 a. 1 r. 26 p., f. and c.	£575
Cowbit Wash, Lincs.—Parcel of land, 11 a. 1 r. 28 p., f. and c.	430
Pinchbeck, Lincs.—Small holding, 30 a. 3 r. 19 p., f. and c.	1,760
September 15. — By ROBT. NEWMAN (at Uxbridge).	
Ickenham, Middx.—Church Farm, 6 a. 2 r. 18 p., f.	2,150
September 16.—By EASTMAN BROS.	
Stoke Newington.—163, 165, 171, and 173, Albion-rd., f., e.r. 180l.	1,515

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

PUBLISHER'S NOTICES.

Nat. Tel., 6112 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XCVIII. (January to June, 1910) was given as a supplement with the issue of July 9.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; Also

READING CASES (Cloth), with Strings, price 9d. each.

THE NINETY-EIGHTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 0d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).

Four lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

. Stamps need not be sent; but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office*, 4, Catherine Street, Strand, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed), 1s.

PRICES CURRENT OF MATERIALS.

. Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.

	£ s. d.
Best Stocks	1 12 0
Picked Stocks for Facings	2 10 0

Per 1000, Delivered at Railway Depôt.

	£ s. d.		£ s. d.
Flettons	1 8 0	Double Headers	13 7 6
Best Fareham Red	3 12 0	One Side and two Ends	17 7 6
Best Red Pressed Roabon Facing	5 0 0	Two Sides and one End	18 7 6
Best Blue Pressed Staffordshire	3 15 0	Splays & Squints	15 17 6
Do. Bullnose	4 0 0	Best Dipped Salt Glzd. Str'toh'rs	10 17 6
Best Stourbridge Fire Bricks	3 14 0	Headers	10 7 6
GLAZED BRICKS. Best White and Ivory Glazed Stretchers	10 17 6	Quoins, Bullnose, and Flats	14 7 6
Headers	10 7 6	D'ble Stretchers	16 7 6
Quoins, Bullnose, and Flats	14 7 6	Double Headers	13 7 6
D'ble Stretchers	16 7 6	One Side and two Ends	17 7 6
		Two Sides and one End	18 7 6
		Splays & Squints	15 17 6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	6 6	per yard delivered.
Thames Ballast	5 0	" "
Best Portland Cement	28 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

Per Ft. Cube.

	s. d.
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons Nine Elms Depot	1 8½
PORTLAND STONE (30 ft. average)—	
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½

Per Ft. Cube, Delivered at Railway Depôt.

	s. d.		s. d.
Ancaster in blocks	1 10	Red Corsehill in blocks	2 2
Beer in blocks	1 6	Closeburn Red Freestone	2 0
Greenshill in blocks	1 10	Red Mansfield Freestone	2 4
Darley Dale in blocks	2 4		

YORK STONE—*Robin Hood Quarry.*

Scappled random blocks	2 10

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes)	0 11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0 4
1½ in. to 2 in. ditto, ditto	0 6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.

Scappled random blocks	3 0

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs (random sizes)	1 2
2 in. self-faced random flags	0 5

SLATES.

Per 1000 at Railway Depôt.

	£ s. d.		£ s. d.
In. in		In. in.	
20 - 10 best blue Bangor	13 2 6	20 × 10 best Eur'ka unfading green	15 17 6
20 - 12 ditto	13 17 6	20 × 12 ditto	18 7 6
20 × 10 1st quality ditto	13 0 0	18 × 10 ditto	13 5 0
20 × 12 ditto	13 15 0	16 × 8 ditto	10 5 0
16 × 8 ditto	7 5 0	20 × 10 permanent green	11 12 6
22 × 10 best blue Portmadoc	12 12 6	18 × 10 ditto	9 12 6
16 × 8 ditto	6 12 6	16 × 8 ditto	6 12 6

TILES.

At Railway Depôt.

	s. d.		s. d.
Best plain red roofing (per 1000)	42 0	Best "Rosemary" brand plain (per 1000)	48 0
Hip and Valley (per doz.)	3 7	Best Ornamental (per 1000)	50 0
Best Broseley (per 1000)	50 0	Hip (per doz.)	4 0
Do. Ornamental (per 1000)	52 6	Valley (per doz.)	3 8
Hip and Valley (per doz.)	4 0	Best "Hartshill" brand, plain sand-faced (per 1000)	50 0
Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57 6	Do. pressed (per 1000)	47 6
Do. Ornamental (per 1000)	60 0	Do. Ornamental (per 1000)	50 0
Hip (per doz.)	4 0	Hip (per doz.)	4 0
Valley (per doz.)	3 0	Valley (per doz.)	3 6
Best Red or Mottled Staffordshire do. (Peakes) (per 1000)	51 9	Staffords. (Hanley) Reds or Brindled (per 1000)	42 6
Do. Ornamental do. (per 1000)	54 6	Hand-made sand-faced (per 1000)	45 0
Hip (per doz.)	4 1	Hip (per doz.)	4 0
Valley (per doz.)	3 8	Valley (per doz.)	3 6

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 0 0	15 10 0
Deals: best 3 by 9	13 10 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 10 0	10 10 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 0 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 5 0 0	5 10 0
Seconds	4 10 0	5 0 0
Small timber (8 in. to 10 in.)	3 17 6	4 0 0
Small timber (6 in. to 8 in.)	3 5 0	3 10 0
Swedish balks	2 12 6	3 0 0
Pitch-pine timber (30 ft. average)	4 10 0	5 5 0

JOINERS' WOOD.	At per standard. £ s. d.	£ s. d.
White Sea: first yellow deals, 3 in. by 11 in.	24 10 0	25 10 0
3 in. by 9 in.	22 10 0	23 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 0 0
Second yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
" " 3 in. by 9 in.	18 0 0	19 10 0
Battens, 2½ in. and 3 in. by 7 in.	14 0 0	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	1 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 10 0	22 10 0
Do. 3 in. by 9 in.	18 10 0	19 10 0
Battens	14 0 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 10 0	17 10 0
Do. 3 in. by 9 in.	15 0 0	16 0 0
Battens	11 10 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 10 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 10 0	11 0 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.	£ s. d.
White Sea and Petersburg—		
First white deals, 3 in. by 11 in.	15 0 0	18 0 0
" " 3 in. by 9 in.	14 0 0	14 10 0
Battens	11 10 0	12 10 0
Second white deals, 3 in. by 11 in.	14 0 0	15 0 0
" " 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 10 0	11 0 0
Pitch-pine: deals	19 0 0	21 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	0 3 9
Small " "	0 2 6	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 6	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	0 0 9½
¾ in. do. do	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 10	0 1 1
Selected, Figury, per ft. super as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. super as inch	0 0 10	0 1 0
Teak, per load	18 0 0	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0

Prepared Flooring, etc.—	Per square. £ s. d.	£ s. d.
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 0
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13
1 in. by 7 in. " "	0 14 0	0 18 6
¾ in. by 7 in. white " "	0 10 0	0 11 0
1 in. by 7 in. " "	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	7 10 0
Compound Girders, ordinary sections	9 0 0	10 0 0
Steel Compound Stanchions	11 0 0	12 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	10 0 0
Fitch Plates	9 0 0	9 10 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	8 10 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	8 10 0	9 0 0
Staffordshire Crown Bars, good merchant quality	8 15 0	9 5 0
Staffordshire "Marked Bars"	10 10 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
" " Galvanised	17 0 0	—

(*And upwards, according to size and gauge.)

Sheet Iron Black— Ordinary sizes to 20 g.	9 15 0	—
" " 24 g.	10 15 0	—
" " 26 g.	12 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 0 0	—
Ordinary sizes to 22 g. and 24 g.	15 10 0	—
" " 26 g.	16 10 0	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	18 0 0	—
" " 22 g. and 24 g.	18 10 0	—
" " 26 g.	20 0 0	—
Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g.	14 10 0	—
" " 22 g. and 24 g.	14 15 0	—
" " 26 g.	16 5 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12 0 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	—
" " 26 g.	15 0 0	—
Cut Nails, 3 in. to 6 in.	10 10 0	11 0 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 4lb. and up.	16 0 0	—
Pipe in coils	1d 0 0	—
Soil pipe	19 10 0	—
Compo pipe	19 10 0	—
ZINC—Sheet—	In casks of 10 cwt.	
Vielle Montagne	28 12 6	—
Silesian	28 5 0	—
Zinc, in bundles, 1s. per cwt. extra.		
COPPER— Strong Sheet per lb.	0 1 0	—
Thin " "	0 1 1	—
Copper nails "	0 0 10	—
Copper wire "	0 0 10	—
BRASS— Strong Sheet "	0 0 11	—
Thin "	0 1 0	—
TIN—English Ingots "	0 1 6	—
SOLDER—Plumbers' "	0 0 7	—
Tinmen's "	0 0 9	—
Blowpipe "	0 1 0	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

Per Ft., Delivered.

15 oz. thirds	2½d.	26 oz. fourths	3d.
" fourths	1½d.	32 oz. thirds	5d.
21 oz. thirds	3d.	" fourths	4½d.
" fourths	2½d.	Fluted Sheet, 15 oz.	3½d.
26 oz. thirds	4d.	" 21 oz.	4½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

Per Ft., Delivered.

¼ Hartley's	3d.	Figured, Oxford	
,,	2½d.	Rolled, & 'Oceanic'	
,,	2¾d.	Glass, white	3½d.
		Ditto, tinted	5d.

OILS, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	3	11
,, ,, in barrels	,,	0	4	0
,, ,, in drums	,,	0	4	2
Boiled ,, in barrels	,,	0	4	2
,, ,, in drums	,,	0	4	5
Turpentine in barrels	,,	0	4	5
,, in drums	,,	0	4	7
Genuine Ground English White Lead	per ton	20	10	0
Red Lead, Dry	,,	20	0	0
Best Linseed Oil Putty	per cwt.	0	10	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	6
Fine Elastic Carriage	0	12	0
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	10	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flating Varnish	0	18	0
White Pale Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	0
Berlin Black	0	16	0
Knotting	0	10	9
French and Brush Polish	0	10	6

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 a.m. *on Thursday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BRIDLINGTON.—For making alterations to No. 49, Marshall-avenue, for Mr. G. W. Blashill. Mr. Samuel Dyer, architect, 29, Quay-road, Bridlington:—
E. Wilson, Hilderthorpe-road, Bridlington.. £73

COXHEATH.—For painting and repairing guttering at the workhouse and schools, for Maidstone Guardians:—

R. Hodge	£343 10	Grey Barney & Son	£253 13
Woollaston Bros..	275 0	W. T. Burrows ..	231 10
J. Crundwell	270 0	J. Sellick & Son, Maidstone*	213 7
E. T. Jeffrey	259 0		

FRINTON-ON-SEA.—For constructing sea wall, etc., for Urban District Council. Mr. E. M. Bate, Surveyor to the Council, Council Offices, Frinton-on-Sea. Quantities by Surveyor:—

G. Lawson & Son	£20,738	0	4
C. Ford	16,199	0	0
W. Hill & Co.	16,157	8	2
Kirk & Randall	15,961	0	0
S. Wood	14,676	19	4
H. V. Smith & Co., Ltd.	14,657	18	7
A. H. Clarke	14,625	17	6
T. Pedrette	14,253	19	4
G. Bell & Sons, Ltd.	13,898	0	0
J. Dickson	13,207	3	5
W. Griffiths & Co., Ltd.	13,154	2	2
W. Muirhead & Co., Ltd.	13,142	0	5
Const. England Contracting Co., Ltd.	13,080	9	10
A. Fasey & Son	13,038	12	9
Paramore, Ltd.	13,005	1	7
O. Wright & Co.	12,776	7	0
J. Strachan	12,600	0	0
R. J. May	12,249	14	0
O. G. Osenton	12,201	14	3
R. Finnigan	11,812	17	4
P. Wilson & Co.	11,651	18	0
A. E. Farr	10,880	0	0
Exors. J. Arundel, Bradford	9,957	4	10

[Surveyor's estimate, £11,500.]

GLENFIELD.—For construction of new foul sewers and manholes, etc., and about 1,070 yds. of 9-in. stoneware pipe, for Blaby Rural District Council. Mr. A. Hall, Engineer, Architect, and Surveyor, 8, St. Martin's, Leicester:—

C. Randle....	£1,156	17	6
F. Elliott	1,103	0	0
J. E. Johnson & Son, Ltd.	1,040	0	0
A. Jewell	972	0	0
C. Chamberlain	971	0	0
Stimpson & Rollston	£967	8	2
A. E. Palmer ..	898	0	0
Bowles & Son, Leicester*....	888	0	0

HAVANT.—For constructing storage tanks at the sewage works, for Urban District Council. Mr. A. G. Stallard, F.S.I., Engineer to the Council, Havant:—
A. G. Osenton, West Horsley, Surrey* £671

HIPPENHOLME.—For constructing 9-in. pipe sewer from Syke Wells to Priestley Green, for the Urban District Council. Mr. G. Wharton Thompson, Engineer and Surveyor to the Council, Council Offices, Hippenholme:—

I. S. Dodd	£474	10	0
A. Graham & Sons	473	2	6
E. W. Bedford.	450	3	7
I. E. Aspinall .	421	5	10
W. Stocks	389	10	0
H. E. Dawson.	£359	11	3
D. Brook	357	17	6
S. Wilkinson, Hippenholme*	356	0	0
J. Bateman ..	288	5	10

HULL.—Accepted for painting the roofs of certain markets, for the Markets Committee. Mr. A. E. White, M.Inst.C.E., City Engineer, Town Hall, Hull:—

Market Hall.
A. Christopher, 19, Spring-street, Hull £34 7 6

Green Market.
A. Christopher, 19, Spring-street, Hull £24 12 0

Game Stores.
C. S. Drury & Son, 6, Caroline-street, Hull £10 17 6

LIVERPOOL.—For the erection of the Waterloo Baptist Church and Schools. Messrs. George Baines & Son, architects, 5, Clements Inn, Strand, London, W.C.:—
Brown & Backhouse, Liverpool* £5,019
[Lowest tender received.]

LONDON, N.—For painting and other works to the interior and exterior of the Islington Infirmary, Highgate-hill, N., for the Guardians of the Poor of St. Mary, Islington. Mr. Edmund J. Harrison, architect, 9, Gray's Inn-square, W.C.:—

	Internal Work.	External Work.
Hasell & Stevens	£383 0 0	—
A. Mackinley.....	550 0 0	£1,181 10 0
S. Brown & Son	663 7 6	1,040 11 0
Campbell & Christmas..	465 0 0	1,200 0 0
H. Hudgell.....	412 18 0	1,150 0 0
Richards & Son.....	357 0 0	1,185 0 0
W. Reason.....	399 0 0	1,050 0 0
Wollaston & Co.	339 0 0	960 0 0
Whitby Bros.	346 0 0	918 0 0
J. Robbins.....	613 0 0	610 0 0
Dearing & Co.	401 0 0	799 0 0
Ferguson & Co.....	363 12 0	828 6 0
A. Cheetham.....	334 0 0	830 0 0
Stokes & Sons	336 8 4	789 15 0
J. Johnson.....	340 0 0	786 0 0
F. Sage & Co.....	330 0 0	720 0 0
F. W. Dainton	344 10 0	693 0 0
Wollaston Bros.....	270 0 0	780 0 0
Scott-Fenn.....	299 0 0	699 0 0
B. E. Nightingale	278 0 0	640 0 0
B. Jewell, 90, Stroud Green-road, Finsbury Park, N.*	275 0 0	565 0 0

LONDON.—For alterations and additions to the Cavendish and British Hotels, Jermyn-street, S.W. Messrs. Cheston & Perkin, architects:—

E. Lawrence & Sons	£10,560	F. G. Minter	£9,948
Killby & Gayford .	10,559	W. Johnson & Co., Ltd.....	9,835
H. J. Williams, Ltd.	10,489	J. W. Falkner & Sons	9,483
Hall, Bedall, & Co..	10,265	F. & H. F. Higgs ..	9,460
G. Munday & Sons	9,995	W. J. Maddison* ..	9,355
Higgs & Hill.....	9,990		
J. Carmichael	9,976		

LONDON.—For building vicarage house, for the benefice of All Hallows, East India-road, E. Messrs. Heazell & Sons, architects, Nottingham:—

W. H. Knight	£2,685	Barratt & Power ..	£2,159
Newell & Lusty	2,400	J. W. Jerram, East Ham*	1,975
F. & T. Thorne	2,278		
W. J. Maddison....	2,217		

LONDON.—For alterations to No. 24, Gt. Cumberland-place, W., for Lady Sarah Wilson. Mr. Fredk. W. Foster, architect, 26, Bedford-row, W.C.:—

Maple & Co.	£2,375	Phillips & Son	£1,750
Holliday & Greenwood.....	1,797	Cowtan & Sons	1,750
		Foxley & Co.*	1,694

POLSKATH.—For erection of a bungalow, for the Lord Bishop of Truro. Mr. Arthur Gilbert, architect, 3, Montpelier-terrace, Torpoint:—

W. E. Bennett	£1 225	F. J. Stanbury, Devonport*	£1,000
G. Miners	1,075	E. Derrent	720

WANDSWORTH.—For works to be carried out at "Titchfield" and "Minehead," Onseley-road, Balham, for the Guardians:—

K. Milan	£450	0 0	B. E. Nightingale	£323	0 0
J. Carney & Sons	382	0 0	S. J. Collins ..	310	0 0
J. Farmer & Sons	377	10 0	Woollaston Bros., 22, Rockmead-road, South Hackney*....	300	10 0
F. T. Singleton	375	0 0			
R. S. Ronald ..	365	0 0			
Sharpington & Co.	359	0 0			
A. W. Samways	335	0 0			
Curd Bros. & Co.	330	0 0			

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